The
JOURNAL
of the AMERICAN
OSTEOPATHIC ASSOCIATION

Nov. 1956 / Convention Keynote Address
Neuropsychiatric supplement

New (2nd) Edition! **Friedberg's Diseases of the Heart**

This *New (2nd) Edition* is the most complete and up-to-date book concerning the heart in print today. Here is a fresh new source of practical and useful information on the *recognition, treatment and understanding* of every type of cardiac disorder. The approach throughout is from the point of view of pathologic physiolgy with brilliant delineation and interweaving of all of the various factors of dysfunction that make up the picture of a sick heart. You see the elements that may precipitate heart disease; the progression of the disease with its attendant structural and functional changes; the symptoms and signs that these changes may produce; how the author's recommended therapeutic measures may combat, arrest, or compensate for the dysfunction present.

In this up-to-the-minute *New (2nd) Edition* you will find 3 entirely new chapters on graphic methods of cardiac examination — *electrocardiography, vectorcardiography, ballistocardiography, cardiac catheterization, etc.* Also included are discussions on the recent direct vision techniques in cardiac surgery.

By CHARLES K. FRIEDBERG, M.D., Attending Physician, Mount Sinai Hospital, New York; Associate Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University. 1161 Pages, 7"x10", with 155 illustrations. $18.00. *New (2nd) Edition!*

W. B. SAUNDERS COMPANY • **West Washington Square, Philadelphia 5**

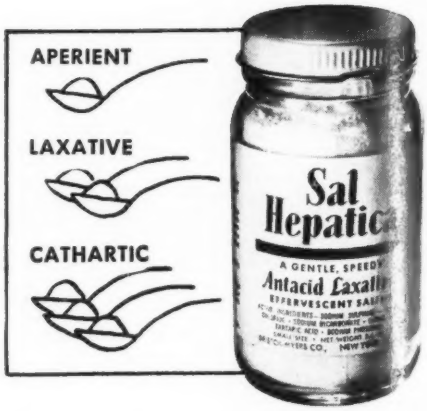
FOR THREE GENERATIONS, PHARMACIES HAVE SUPPLIED ANTACID, EFFERVESCENT

Sal Hepatica®

Since 1897, pharmacists have been dispensing SAL HEPATICA —the fast-acting yet gentle laxative.

Because sparkling SAL HEPATICA is both antacid and effervescent, it passes rapidly through the stomach. In the intestine it provides fluid bulk by its osmotic action. This bulk stimulates peristalsis. Prompt evacuation usually follows—within an hour, if taken before breakfast—before bedtime, if taken half an hour before the evening meal.

SAL HEPATICA is pleasant-tasting, acts without griping, therefore is liked by patients. Because it is antacid, it relieves the gastric hyperacidity frequently accompanying constipation.



BRISTOL-MYERS CO., 19 West 50 Street, New York 20, N. Y.

Small-focus rotating anode x-ray tube
easy, accurate radiographic centering by
projected knife-edge lightbeam.

Picker x-ray

PICKER X-RAY CORPORATION
25 South Broadway, White Plains, N. Y.

save up to $1,976

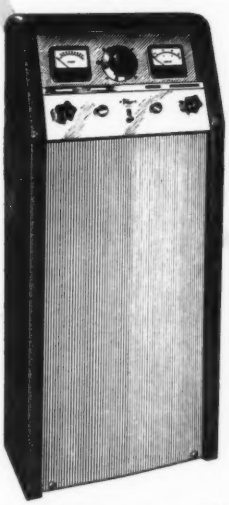
on new "packaged" CENTURION 200 ma radiographic-fluoroscopic units

For a limited time, here's your chance to acquire a fine Picker 200 ma x-ray combination at a very substantial saving. Not skimpy "built-to-price" equipment, mind you, but a standard Picker Centurion II x-ray unit with all the advantages (too many to list here; we can cite only a few) that mean so much in operating ease, technical flexibility and long-term satisfaction.

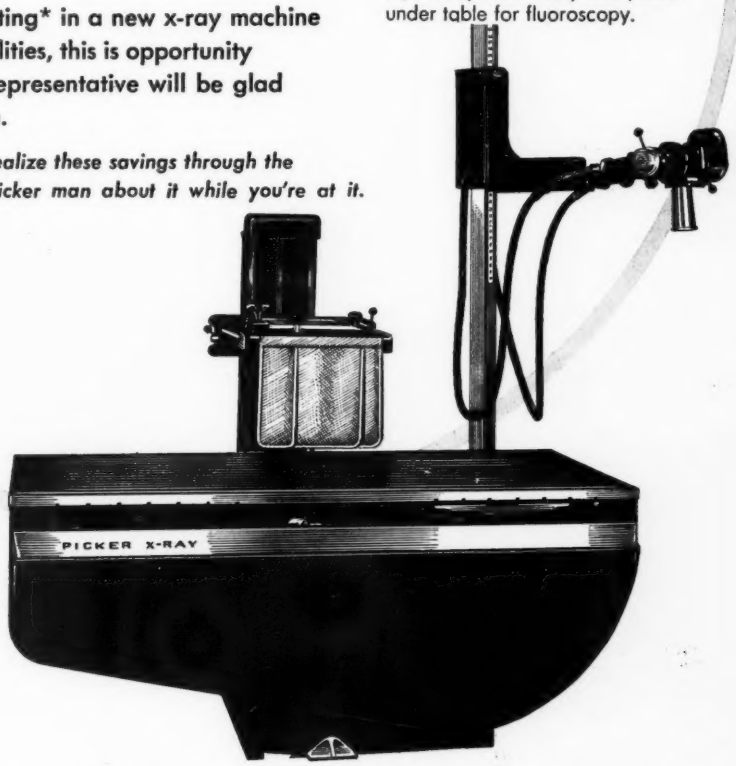
If you've been thinking of investing* in a new x-ray machine or upgrading your present facilities, this is opportunity knocking. Your local Picker representative will be glad to show you why. Call him in.

If you'd rather, you can also realize these savings through the Picker Rental Plan. Ask the Picker man about it while you're at it.

Smooth-gliding floor-ceiling Twintrack tubestand rotates full circle with 90° clickstops. Rigid self-swallowing telescopic tubearm slips x-ray tube deftly into place under table for fluoroscopy.



Heavy duty Picker generator (200 ma, 100 KVP) and distinguished upright control cabinet. Automatic Monitor operation. Full-range time-KV selection without technical compromises.



High-style "prestige" table, luxurious finish. Clear access all around — front, back, both ends — no protruding floor obstructions. Poised hand-rock or quiet motor-drive. Weight counterbalanced fluoroscopic tower with either full size screen or Polyfilmer for 8" x 10" spotfilms (as shown here)

The
JOURNAL
of the AMERICAN
OSTEOPATHIC ASSOCIATION

Nov. 1956 Vol. 56, No. 3

159 The somatic components of disease.
Richard N. MacBain, D.O., Chicago, Illinois

165 Practical application of blood volume determination.
Joseph F. DePetris, D.O., Dallas, Texas

168 Cardiac arrest.
J. Donald Sheets, D.O., F.A.C.O.S., Detroit, Michigan

172 Problems of the cervical spine.
Arnold Gerber, D.O., M.Sc., Philadelphia, Pennsylvania

179 Editorials

183 Notes and Comments

185 Department of Public Relations

186 Department of Public Affairs

187 Current Literature

189 Book Reviews

193 Neuropsychiatric Supplement

195 Symposium on psychoanalysis.

Introduction.
Paul B. Harbour, D.O., Philadelphia, Pennsylvania

Psychoanalysis—What it is and what it is not.
Edythe G. Varner, D.O., Philadelphia, Pennsylvania

Psychoanalysis in medicine and allied fields.
Wilmer H. Bath, D.O., Conshohocken, Pennsylvania

Freud: Scientist and explorer of the unconscious.
Harvey J. Fischer, Ph.D., Philadelphia, Pennsylvania

Transference and countertransference.
Louis K. Baron, M.A., Philadelphia, Pennsylvania

206 The pathology of cerebral concussion.
J. Donald Scherbart, Long Beach, California

210 Psychoanalysis in a case of ecdysiasm.
Paul B. Harbour, D.O., Philadelphia, Pennsylvania

213 Diagnosis of acute infections of the central nervous system.
E. J. Rennoe, D.O., Los Angeles, California

Published monthly by the American Osteopathic Association. Printed by Pioneer Publishing Company. **PUBLICATION OFFICE**, 100 S. Kenilworth Ave., Oak Park, Ill. **EDITORIAL AND EXECUTIVE OFFICES**, 212 E. Ohio St., Chicago 11, Ill. Subscription $10 a year; single copies, $1.00. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 31, 1922. Entered at Oak Park, Ill., Post Office as second class matter April 1, 1926, under the Act of March 3, 1879.

ALL CORRESPONDENCE should be addressed to 212 E. Ohio St., Chicago, Ill. **CHANGE OF ADDRESS**: If possible, clip address from mailing envelope of your copy of this magazine and send along with new address (with zone number if any). Allow 5 weeks for change-over.

Copyright, 1956, by American Osteopathic Association.

INFORMATION FOR CONTRIBUTORS

THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION is the official scientific publication of the American Osteopathic Association. Articles are accepted with the understanding that they have not been published or accepted for publication elsewhere.

MANUSCRIPTS

1. Manuscripts should be typed in triplicate, the original and carbon sent to THE JOURNAL, and one carbon kept by the author. All copy, including quotations, footnotes, tables, references, and legends for figures, should be double-spaced, with ample margins.

2. References are required for all material derived from the work of others, whether or not authors' names are mentioned. Reference numbers should be assigned in order of reference in the article. Each reference must include the name of the author and the full title of the article or book. For periodicals, the name, volume number, complete date, and inclusive paging of the article are required. For books, the edition, the name and location of the publisher, and the year of publication are required. Exact page numbers must be given for all direct quotations.

3. The author's degrees and teaching affiliations should be given.

4. The article should end with a comprehensive summary.

ILLUSTRATIONS

1. Photographs should be unmounted, untrimmed, glossy prints.

2. Figures, charts, tables which are to be engraved, and lettering on prints should be in black (India) ink on good quality white paper. Lettering must be large enough to be read when reduced.

3. Original roentgenograms or slides can be used for reproduction, but direct-contact glossy prints from originals are preferable.

4. All illustrations must be numbered and the top indicated. If original roentgenograms or slides are submitted, the front must also be indicated.

5. Good illustrations enhance the value of articles, and contributors are encouraged to submit illustrative material with manuscripts.

6. When illustrations which have appeared elsewhere are submitted, full information should be given about previous publication, whether or not permission has been obtained, and credit to be given.

COPIES OF THE JOURNAL

1. Three copies of THE JOURNAL containing his article will be sent to the author on request.

REPRINTS

1. A price list with information for ordering reprints is sent with galley proofs.

FOR ADDITIONAL INFORMATION, PLEASE WRITE TO THE EDITOR

increasingly preferred

by physicians

strikingly effective

for patients

in rheumatoid arthritis

METICORTEN*

(PREDNISONE)

excellent relief of pain, swelling, tenderness; diminishes joint stiffness—facilitates early physical therapy—expedites rehabilitation

dietary regulations usually unnecessary

minimizes incidence of electrolyte imbalance

1, 2.5 and 5 mg. tablets

METICORTEN,* brand of prednisone.

*T. M.

MC-J-2376

THIS HYPERTENSIVE PATIENT IS A CANDIDATE FOR

VERALBA-R*

PROTOVERATRINES A AND B WITH RESERPINE

Conservative therapy in hypertension can be made more effective

EFFECTIVE: When combined with reserpine, hypotensive effects of protoveratrines A and B can be achieved with smaller dosage. Side effects are markedly reduced.

SAFE: Veralba-R can be given routinely without causing postural hypotension or impairing the blood supply to the heart, brain and other vital organs. Dosage is simple.

ACCURATE: Potency is defined by chemical assay. All ingredients are in purified, crystalline form.

Each Veralba-R tablet contains 0.4 mg. of protoveratrines and 0.08 mg. of reserpine. Bottles of 100 and 1000 scored tablets.

*Trademark

PITMAN-MOORE COMPANY • *Division of Allied Laboratories, Inc.,* **INDIANAPOLIS 6, INDIANA**

the high cost of bad habits: gastric hyperacidity

Hurried meals and tense days exact their price in short order. Gastric hyperacidity—whether acute or chronic—can, however, be relieved quickly and pleasantly with Gelusil.

Awake or asleep, the patient is protected: The sustained action of magnesium trisilicate and specially prepared aluminum hydroxide gel restores and maintains a mildly acid gastric pH, without overneutralizing or alkalizing. With Gelusil, the twin dangers of acid rebound and systemic alkalosis are thus avoided.

A new formulation, Gelusil-Lac, now combines the proven antacid action of Gelusil with the sustained buffering effect of specially prepared high-protein (low-fat) milk solids. The formula is designed to *prevent* the onset of gastric pain, particularly "middle-of-the-night" attacks.

Nonconstipating: The aluminum hydroxide component in Gelusil assures a low aluminum ion concentration; hence the formation of astringent—and constipating—aluminum chloride is minimal.

Dosage: 2 Gelusil tablets or 2 teaspoonfuls of Gelusil liquid two hours after eating or when symptoms are pronounced. Each tablet or teaspoonful provides: 7½ gr. magnesium trisilicate and 4 gr. aluminum hydroxide gel. Gelusil-Lac: at bedtime, one heaping tablespoonful stirred rapidly into one-half glass (4 fl. oz.) of cool water. (Provides equivalent of 4 Gelusil tablets.)

Gelusil®/Gelusil-Lac

WARNER-CHILCOTT

100 YEARS OF SERVICE TO THE MEDICAL PROFESSION

relaxes both the body and the mind

well suited for prolonged therapy

- well tolerated, nonaddictive, essentially nontoxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: **anxiety and tension states, muscle spasm.**

THE ORIGINAL MEPROBAMATE

Miltown®

Tranquilizer with muscle-relaxant action

DISCOVERED AND INTRODUCED BY WALLACE LABORATORIES, *New Brunswick, N.J.*

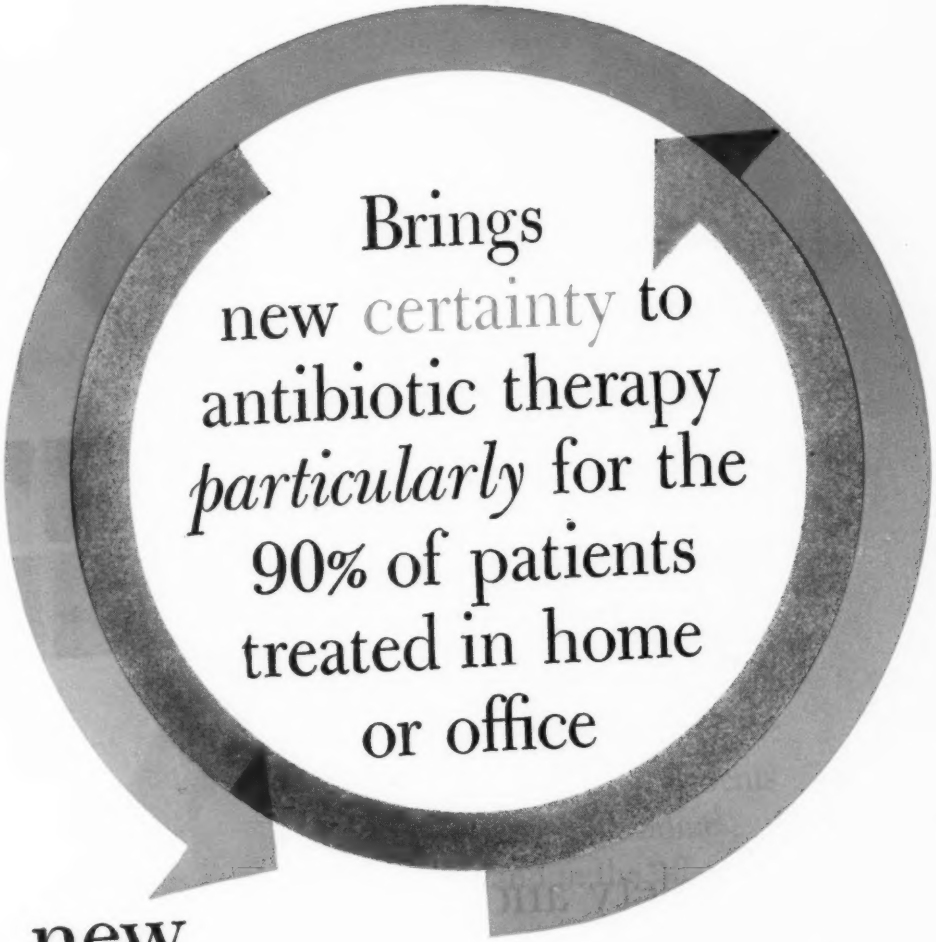
2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U. S. Patent 2,724,720

SUPPLIED: *400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.*

Literature and Samples Available on Request

THE MILTOWN MOLECULE

CM-3664-R



new

Sigmamycin*

OLEANDOMYCIN TETRACYCLINE

*TRADEMARK

a new maximum
in therapeutic
effectiveness

a new maximum
in protection
against
resistance

a new maximum
in safety and
toleration

for
your
entire

multi-spectrum
synergistically
strengthened...

Sigma

OLEANDOMYCIN TETRACYCLINE

patient
population

a new certainty

in antibiotic therapy, particularly for the 90% of patients treated at home and in the office

Superior control of infectious diseases through superior control of the changing microbial population is now available in a new formulation of tetracycline, outstanding broad-spectrum antibiotic, with oleandomycin, Pfizer-discovered new antimicrobial agent which controls resistant strains. The synergistic combination now brings to antibiotic therapy: (1) a new fuller antimicrobial spectrum which includes even "resistant" staphylococci; (2) new superior protection against emergence of new resistant strains; (3) new superior safety and toleration. *TRADEMARK

mycin*

Pfizer

superior control
of infectious disease through
superior control of the
changing microbial population

new

Sigmamycin*

OLEANDOMYCIN TETRACYCLINE

A synergistically strengthened multi-spectrum antibiotic

Sigmamycin is a new antibiotic formulation providing: (1) the unsurpassed broad-spectrum activity of tetracycline, the outstanding broad-spectrum antibiotic discovered and identified by Pfizer; (2) the action of oleandomycin, the new antimicrobial agent which combats those strains, particularly among staphylococci, now resistant to tetracycline and other antibiotics.

Sigmamycin embodies a new concept in the use of antibiotics, for with this new synergistically active preparation, the development of refractory pathogens and their emergence as important sources of superinfection are more fully controlled.

New superior safety and toleration— Sigmamycin brings to antibiotic therapy new superior safety, new unexcelled toleration because: (1) tetracycline, an outstandingly well-tolerated antibiotic, is formulated with oleandomycin, also known to be remarkably free of adverse reactions; (2) the synergism between oleandomycin and tetracycline enhances antimicrobial potency.

Dosage: 1 to 2 capsules q.i.d.

Supplied: Capsules, 250 mg. (oleandomycin 83 mg., tetracycline 167 mg.) Bottles of 16 and 100.

*TRADEMARK

Pfizer

PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y.

clinically proved, before introduction, in over 12,000 patients

announcing

Compazine★

a further advance in psychopharmacology

a true "tranquilizer"
and potent antiemetic
with minimal side effects

indicated in:

- mental and emotional disturbances—mild and moderate—encountered in everyday practice
- nausea and vomiting—mild and severe

available in 5 mg. tablets

SKF *Smith, Kline & French Laboratories, Philadelphia 1*

★Trademark for proclorperazine, S.K.F.

new 100 mg. capsule

for greater convenience and dosage flexibility.

Colace

DIOCTYL SODIUM SULFOSUCCINATE, MEAD JOHNSON*

In chronic constipation and in patients with hemorrhoids, Colace provides a safe and gentle way to prevent hard stools. By reducing surface tension, Colace increases the wetting efficiency of intestinal water. This purely physical action keeps stools normally soft and softens hardened stools for easy, natural passage.

No undesirable side effects have been reported with Colace. There are no known contraindications to its use.

*Patents pending

softens stools for easy passage

without laxative action · without adding bulk

COLACE DOSAGE RECOMMENDATIONS

SUGGESTED ORAL DAILY DOSAGE†

0 to 3 years. . . . 10 to 40 mg.
3 to 6 years. . . . 20 to 60 mg.
6 to 12 years. . . . 40 to 120 mg.
Adults. . . . . 50 to 200 mg.

†Colace may be given in divided doses. The higher dosage is recommended during initial phase of therapy. Dosage should be adjusted as required by individual response.

Note: When bowel motility is impaired, a mild peristaltic stimulant or Colace-containing enemas may be needed in addition to Colace by mouth.

ENEMA FOR ACUTE CONSTIPATION, FECAL IMPACTION

add 50 to 100 mg. of Colace (5 to 10 cc. of Colace Liquid) to a retention or flushing enema.

THE COLACE FAMILY

Colace Capsules 100 mg., bottles of 30, 60 and 250.

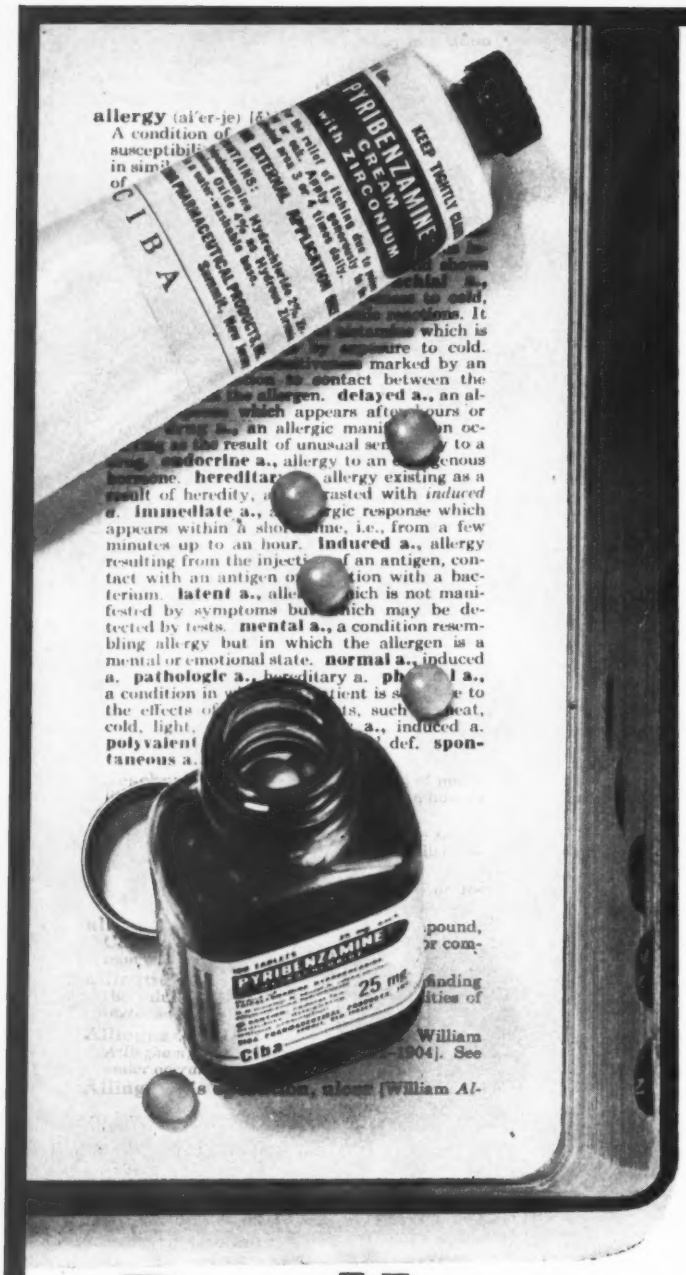
Colace Capsules 50 mg., bottles of 30, 60 and 250.

Colace Liquid (1% Solution: 1 cc.=10 mg.), 30 cc. bottles with calibrated dropper.

MEAD JOHNSON

SYMBOL OF SERVICE IN MEDICINE

00356



...STILL A STANDARD

Shortly after antihistaminic therapy was introduced, Pyribenzamine was chosen as a standard among 17 antihistaminics compared for their power to inhibit histamine flare.[1] Six years later, Pyribenzamine still was "probably prescribed more widely than any other histamine antagonist."[2] Effectiveness in controlling edema, erythema and whealing has made Pyribenzamine an enduring antihistaminic standby in such conditions as allergic dermatitis and rhinitis, urticaria, serum sickness and drug reactions.

1. Lovejoy, H. B., Feinberg, S. M., and Canterbury, E. A.: J. Allergy *20*:350 (Sept.) 1949. 2. Goodman, L. S., and Gilman, A.: *The Pharmacological Basis of Therapeutics*, 2nd Ed., The Macmillan Company, New York, 1955, p. 660.

Pyribenzamine®

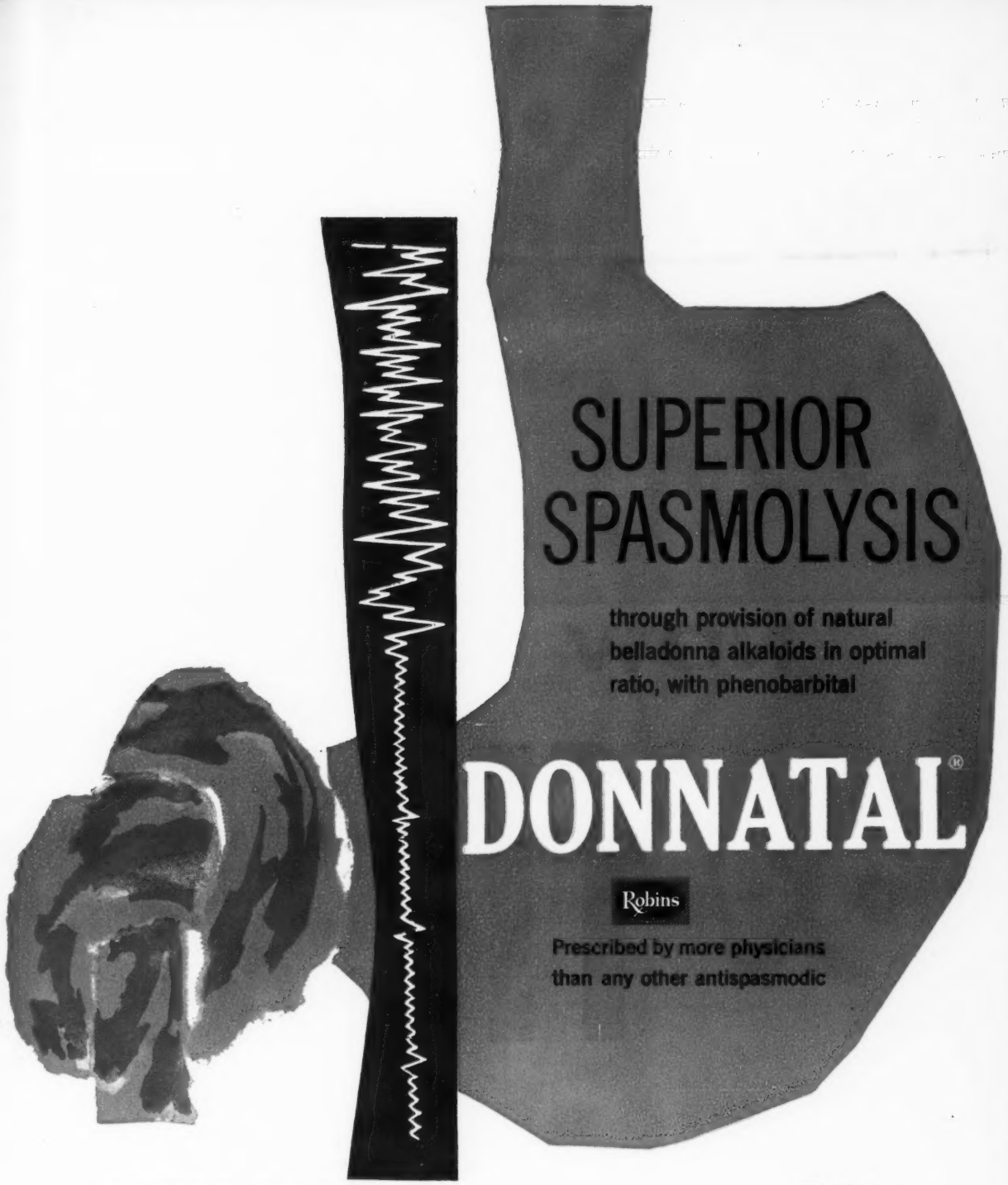
hydrochloride

(tripelennamine hydrochloride CIBA)

Dosage: One or two 50-mg. tablets as required. **Supply:** *Tablets*, 50 mg. (scored) and 25 mg. (sugar-coated).

2/3216M

CIBA SUMMIT, N. J.



A. H. ROBINS CO., INC., RICHMOND 20, VA.
Ethical Pharmaceuticals of Merit since 1878

Robins

FORMULA

Donnatal Tablets
Donnatal Capsules
Donnatal Elixir (per 5 cc.)

Hyoscyamine Sulfate	0.1037 mg.
Atropine Sulfate	0.0194 mg.
Hyoscine Hydrobromide	0.0065 mg.
Phenobarbital (¼ gr.)	16.2 mg.

DONNATAL® EXTENTABS®
(Extended Action Tablets)

Each Extentab (equivalent to 3 Tablets) provides sustained 1-tablet effects . . . evenly, for 10 to 12 hours—all day or all night on a single dose.

Also available without phenobarbital component, as **Donna® Extentabs®**.

criteria for skeletal muscle relaxant

"The need for a therapeutic agent that would provide prolonged relaxation of spastic or rigid muscles is generally recognized. To date, there has been no available drug proved sufficiently safe, effective, or long-lasting to justify its general use."[1]

Before Flexin

NOW

flexin*

(Zoxazolamine,† McNeil)

fulfills these

supplied: 250 mg. yellow, scored tablets, bottles of 50.

(1) Abrahamsen, E. H., and Baird, H. W., III: J.A.M.A. *160*:749 (Mar. 3) 1956.
(2) Amols, W.: J.A.M.A. *160*:742 (Mar. 3) 1956.
(3) Rodriguez-Gomez, M.; Valdes-Rodriguez, A., and Drew, A. L.: J.A.M.A. *160*:752 (Mar. 3) 1956.
(4) Smith, R. T.; Kron, K. M.; Peak, W. P., and Hermann, I. F.: J.A.M.A. *160*:745 (Mar. 3) 1956.

*T.M. †U. S. Patent Pending

FLEXIN is sufficiently safe

"No significant alterations of pulse, blood pressure, or respiration were observed [during therapy with FLEXIN], and there were no deleterious effects noted in blood counts, urinalyses, or liver and kidney function tests."[2]

"...no important signs of toxicity were found in blood or urine studies...drowsiness and transient dizziness in an occasional patient, together with occasional mild gastric irritation, were the only undesirable side-effects observed..."[3]

FLEXIN is effective

"When it [FLEXIN] was administered orally in doses of 250 to 500 mg. three and four times a day, 14 of 18 patients with spasticity due to spinal cord lesions showed objective improvement of spasticity."[3]

"Rheumatic diseases with the major disability caused by stiffness and aching appear to respond well..."[4]

FLEXIN has a long duration of action

"The administration of an effective dose of zoxazolamine [FLEXIN] was usually followed by muscular relaxation within an hour, with the peak effect being reached within two hours and waning within four hours. Some degree of muscular relaxation was occasionally seen 24 hours or longer after discontinuance of therapy."[1]

requirements

McNEIL LABORATORIES, INC · PHILADELPHIA 32, PA. McNEIL

For Study, Teaching and Demonstration

A Complete Line of Anatomical Models, Skeletons and Skulls

SKELETONS—First quality specimens carefully selected and prepared in our workrooms to meet the highest standards...mounted in normal posture with natural articulations...$235; with painted muscle origins and insertions...$385.

SKULLS—Ranging from "extra" to "student" quality...all with hinged jaws, cut calvaria; full or partial dentition depending on quality. Children's, fetal and disarticulated skulls also available. Extra quality skulls... $60; first quality...$55; good quality...$50; student quality ...$30-45. Dissectible demonstration skull...$115.

PLASTIC REPRODUCTIONS ALSO AVAILABLE

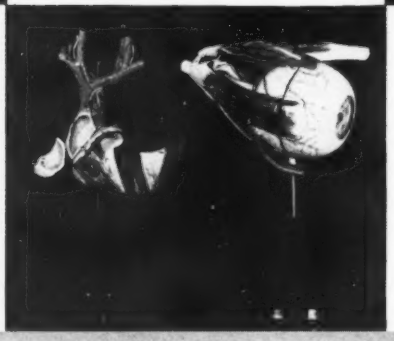
—ideal where cost is a factor

Clay-Adams plastic reproductions are made of durable, break-resistant polyester resin, virtually indistinguishable from natural bone.

The following reproductions are available for immediate delivery at all times:

Adult Human Skeleton	$195
Human Muscular Skeleton	$265
Adult Skull, first quality	$45
Vertebral Column	$50
Pelvis (male)	$40
Herniated Disc	$40

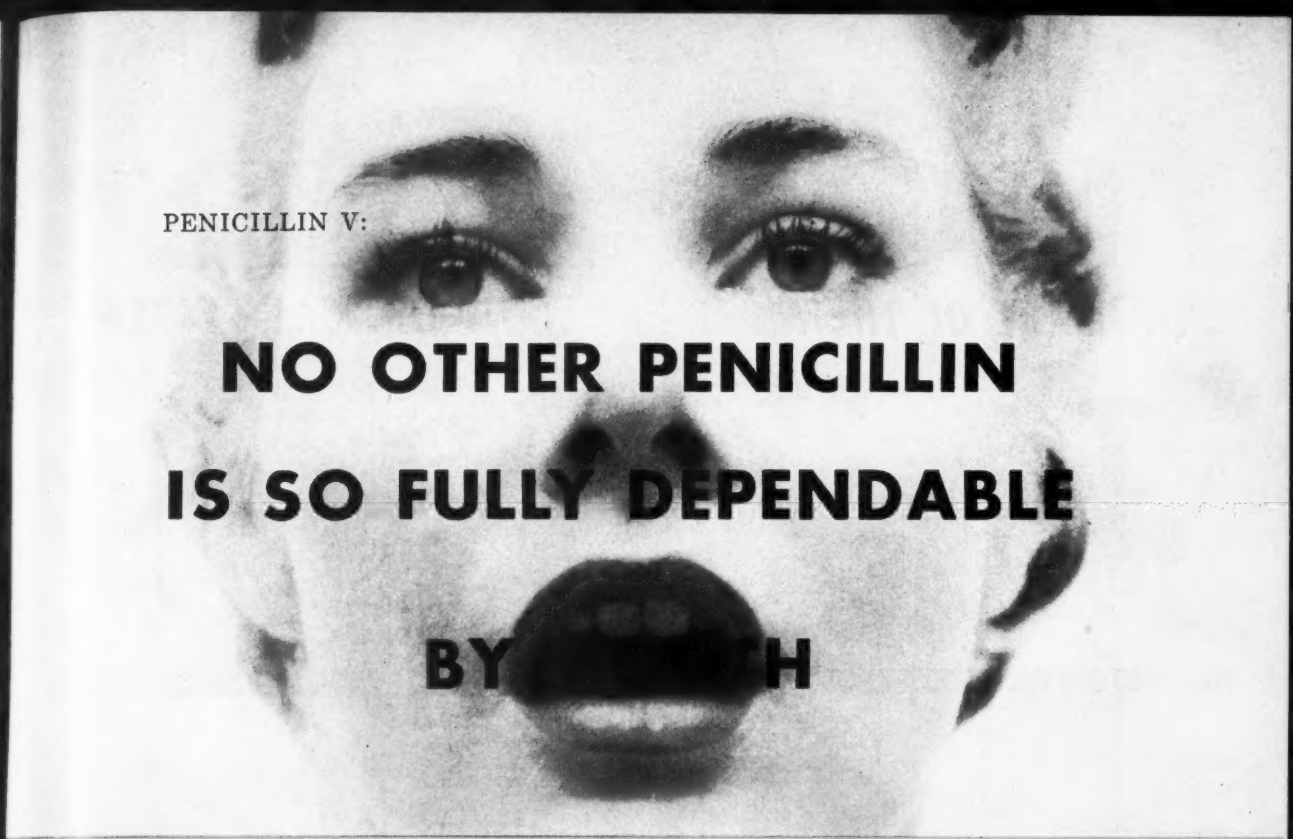
"DURABLE" Heart; Eye—The heart shows detailed internal structure...$45; other heart models, $55 and $38. The eye shows major nerves and blood vessels and the eyeball is dissectible...$30. Write for literature on other "DURABLE" models.



"DURABLE" Anatomical Models—Completely dissectible female torso shows over 500 anatomical structures; made of colored, lightweight, laminated paper; 44" high; washable... $350; male or female full figures...$600.

Remember These Other Clay-Adams Teaching Aids:
Medichromes · Charts & Atlases · Dolls & Manikins.
Descriptive literature on our complete line of skulls, skeletons and other visual aids is available upon request.

Clay-Adams
141 East 25th Street, New York 10



PENICILLIN V:

NO OTHER PENICILLIN IS SO FULLY DEPENDABLE

BY [redacted]H

. . . *dependably* stable in gastric acid

". . . the great proportion of the drug administered passes through the stomach unaltered. . . ."[1]

. . . *dependably* absorbed

". . . and reaches the intestine where absorption readily takes place. . . ."[1]

. . . *dependably* effective

". . . for the first time we can obtain blood concentrations with oral administration that are similar to those obtained with intramuscular injection of penicillin G at comparable doses."[1]

1. Welch, H.: Antibiotic Med. 2:11 (Jan.) 1956.

Oral Penicillin with *Injection* Performance

PEN·VEE*

Oral and *Suspension*

Wyeth
Philadelphia 1, Pa.

PEN • VEE • *Oral* is Penicillin V, Crystalline (Phenoxymethyl Penicillin)

PEN • VEE *Suspension* is Benzathine Penicillin V Oral Suspension

*Trademark

FONTAR®

. . . HEART OF THE MOST BRILLIANT OPTICAL SYSTEM

★ Difficult as it may be to conceive of a measurement of a few millionths of an inch, it is to within such a limit that Fontar lens curvatures are checked. This explains in part, how the remarkable brilliance, clarity and full broad field of undistorted vision that is at once apparent in the *quality of image* revealed through a Fontar Lens System, is achieved.

You observe that objects *at the edge of the field* are as brightly and sharply delineated as those that appear at the focal center. There is neither fuzziness nor blur at the extremes. Distracting halo effects are happily absent. The result is an even, *critical sharpness,* brilliantly illuminated over the entire field of vision.

Thus, the tremendously important advantage of such greatly improved visual clarity permits easier, swifter and more accurate operation, while eye fatigue is reduced.

The Fontar Lens System is the heart of the most brilliant optical system—it is the heart of all National operative and diagnostic instruments.

Your "National" Surgical Supply Dealer is anxious to provide such advanced instruments for you. He will be glad to demonstrate them at your convenience. ★ ★ ★ ★ ★ ★ ★

NATIONAL ELECTRIC INSTRUMENT CO., INC. · 92-21 CORONA AVENUE, ELMHURST 73, N. Y.

MANUFACTURERS OF: OTOSCOPES · OPHTHALMOSCOPES · CYSTOSCOPES · PROCTOSCOPES · NASOPHARYNGOSCOPES · HYSTEROSCOPES · SIGMOIDOSCOPES · CAUTERY SETS · MEDICAL HEADLAMPS

ENGELHARD INDUSTRIES

relieved in most cases, by

MEPHATE®

CAPSULES (Robins) – *superior relaxant*

Breaks the pain-spasm chain-reaction by the relaxant action of mephenesin, enhanced by glutamic acid hydrochloride . . . more effective[2] and longer lasting[1] than mephenesin alone. Eases pain and muscle-spasm without impairing strength; relieves anxiety and nervous tension without impairing mental alertness.

Robins

A. H. ROBINS CO., Inc., RICHMOND 20, VA.
Ethical Pharmaceuticals of Merit since 1878

In each capsule:

Mephenesin	0.25 Gm
Glutamic Acid Hydrochloride	0.30 Gm

1. Bender, T. J., Jr.: J.M.A. Alabama 24:217, 1955.
2. Heymann, A. F. and Smith, R. T.: Jl. Lancet, 71:271, 1951.

for many of those who are "tired all over" . . .

'Cytomel' *promptly* restores normal vitality, energy and activity to those patients whose physical sluggishness is part of a syndrome of generalized metabolic dysfunction. The reason: 'Cytomel' stimulates *cellular* metabolism in affected tissues, organs and organ systems.

Cytomel*

a <u>new</u> agent for treatment of Metabolic Insufficiency

5 mcg. and 25 mcg. (scored) tablets

*Trademark for L-triiodothyronine, S.K.F.

Smith, Kline & French Laboratories, Philadelphia

Upjohn

Relax

the nervous, tense, emotionally unstable:

Reserpoid® *(Pure crystalline alkaloid)*

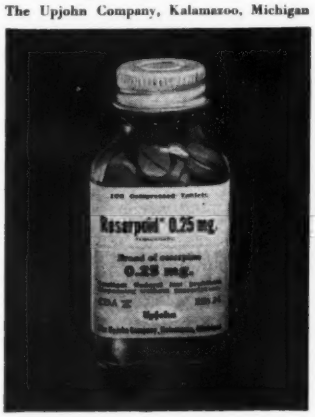
® TRADEMARK FOR THE UPJOHN BRAND OF RESERPINE

Each tablet contains:
Reserpine ..... 0.1 mg.
or 0.25 mg.
or 1.0 mg.
or 4.0 mg.

The elixir contains:
Reserpine ..... 0.25 mg.
per 5 cc. teaspoonful

Supplied:
Scored tablets
0.1 and 0.25 mg. in bottles of 100 and 500
1.0 and 4.0 mg. in bottles of 100
Elixir in pint bottles

The Upjohn Company, Kalamazoo, Michigan



Now Buffered

for faster pain relief and superior gastric tolerance

A nonsystemic buffer (aluminum hydroxide) has now been added — in a new *"sequential release"* tablet — to the formulae of Pabirin and Pabirin AC (Pabirin plus hydrocortisone). The outer layer of this specially constructed and rapidly disintegrating tablet contains the aluminum hydroxide, PABA, and ascorbic acid. Within a few minutes the buffering action of the aluminum hydroxide is made available to protect the stomach against possible irritation by the salicylate. Then the core of the tablet disintegrates to permit rapid absorption of the other antirheumatic ingredients. As a result, gastric tolerance is excellent — pain relief rapid.

	Buffered Pabirin Tablets	Buffered Pabirin AC Tablets (Pabirin plus hydrocortisone)
Hydrocortisone		2.5 mg.
Acetylsalicylic acid (5 gr.)	300 mg.	300 mg.
Para-aminobenzoic acid (5 gr.)	300 mg.	300 mg.
Ascorbic acid	50 mg.	50 mg.
Dried aluminum hydroxide gel	100 mg.	100 mg.

Buffered Pabirin Tablets and Buffered Pabirin AC Tablets are DORSEY *preparations.*

potentiated salicylate therapy in "sequential release" form

for most rheumatoid arthritics

Buffered Pabirin Tablets represent the safest, fast-acting potentiated salicylate therapy which utilizes the synergism of PABA and acetylsalicylic acid to create *rapid, high* and *sustained* salicylate blood levels with *low* salicylate dosage.

BUFFERED
Pabirin®
TABLETS

Dosage: Average dose in arthritis, gout, arthralgia – two or three tablets 3 or 4 times daily. In rheumatic fever, three to five tablets 4 or 5 times daily.

Supplied: In bottles of 100 and 500 tablets.

for resistant rheumatics

Buffered Pabirin AC (Pabirin plus hydrocortisone) Tablets. These new buffered tablets supply the extra steroid benefits of conservative amounts of hydrocortisone supplemented by the action of PABA, acetylsalicylic acid, and vitamin C. This combination creates high dosage steroid effects with low steroid dosage, thus minimizing the danger of adrenal atrophy.

BUFFERED
Pabirin® AC
PABIRIN PLUS HYDROCORTISONE
TABLETS

Dosage: Initially one or two tablets 4 times daily after meals and before retiring. When dosage is reduced it should be done gradually.

Supplied: In bottles of 50 and 250 tablets.

SMITH-DORSEY • Lincoln, Nebraska • a division of the Wander Company

AUTOBIOGRAPHY OF A STANDBY BAUMANOMETER

Hundreds of thousands of doctors all over the world own Baumanometers.

I am a STANDBY and my doctor is a busy New York cardiologist. I usually stand

right by his desk. Sometimes, though, he takes me into one of

his examining rooms. He finds it easy to read my EXACTILT scale, whether he is standing

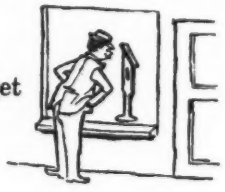
or sitting. I've belonged to Dr. Phil for ten years now, and he is just as

proud of me today as he was the day he picked me out. I have worn well, if I do say

it myself, and I'm just as shiny now as I was then. And of course I give accurate

bloodpressure readings all along the scale. Like every Lifetime Baumanometer *I work on the*

mercury-gravity principle, *the standard for bloodpressure all over* *the world.*

Do you own a Baumanometer, too? If not, why not get  a nice new one at your

Surgical Dealer's.

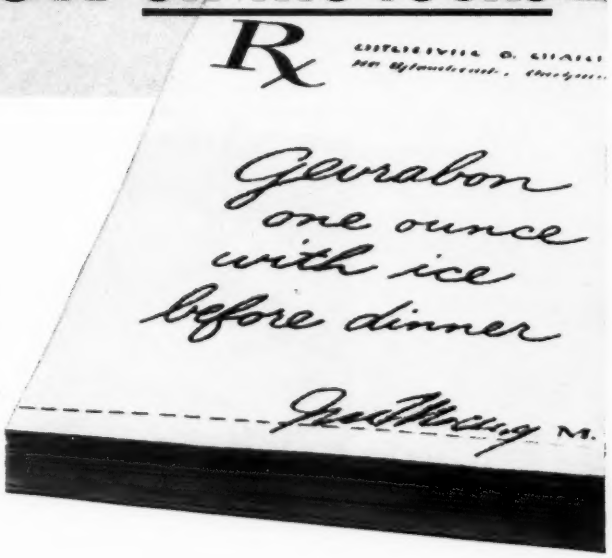
Lifetime Baumanometer®
STANDARD FOR BLOODPRESSURE

W. A. BAUM CO., INC., COPIAGUE, L. I., N. Y.

Since 1916 Originator and Maker of Bloodpressure Apparatus Exclusively

a refreshing
touch of interest
for your
elderly patients

GEVRABON on-the-rocks



Chilling remarkably enhances the flavor and appetite-stimulating effect of GEVRABON.

On ice, GEVRABON serves as a relaxing, vasodilating, sherry-flavored tonic before mealtime. And you assure your elderly patient his vigor-sustaining supplement of specific vitamins and minerals.

Add a refreshing (therapeutic) touch of interest to regular dietary supplementation —specify GEVRABON-ON-THE-ROCKS.

GEVRABON* brand of Geriatric Vitamin-Mineral Supplement *Lederle*.

Each fluid ounce (30 cc.) contains:

Thiamine HCl (B_1)	5 mg. (500% MDR)
Riboflavin (B_2)	2.5 mg. (125% MDR)
Vitamin B_{12}	1 microgram
Niacinamide	50 mg.
Pyridoxine HCl (B_6)	1 mg.
Pantothenic acid (as panthenol)	10 mg.
Choline (as tricholine citrate)	100 mg.
Inositol	100 mg.
Calcium (as Ca glycerophosphate)	48 mg. (6.4% MDR)
Phosphorus (as Ca glycerophosphate)	39 mg. (5.2% MDR)
Iodine (as KI)	1 mg. (1,000 MDR)
Potassium	10 mg.
Magnesium (as $MgCl_2.6H_2O$)	2 mg.
Zinc (as $ZnCl_2$)	2 mg.
Manganese (as $MnCl_2.4H_2O$)	2 mg.
Iron (as ferrous gluconate)	20 mg. (200% MDR)
Alcohol	18%

*Reg. U. S. Pat. Off.

Lederle LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, NEW YORK

NEW

For Pain-Free

of everyday

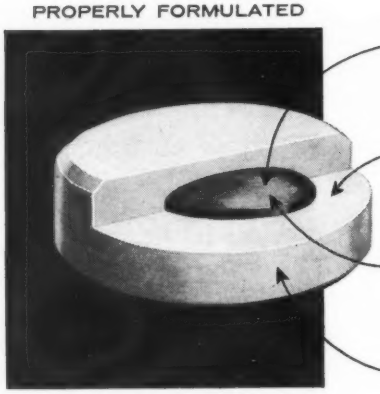
In "Rheumatism"*

Multiple

TEMP

combine:

THE PROPER FORMULA
PROPERLY FORMULATED



PREDNISOLONE *(1 mg.)*

+

ASPIRIN *(0.3 Gm.)*

+

ASCORBIC ACID *(50 mg.)*

+

ANTACID *(0.2 Gm.)*

Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.

* **Early rheumatoid arthritis**
Rheumatoid spondylitis
Osteoarthritis
Still's disease
Psoriatic arthritis
Bursitis
Synovitis
Tenosynovitis
Myositis
Fibrositis
Neuritis

ree**Performance**

ryda ctivities

m" Patients

ltipl Compressed Tablets

POGEN®

(*1 mg.*) ..... for anti-inflammatory, anti-rheumatic benefits *at effective low dosage.*

..... for analgesia plus additional anti-rheumatic activity.

(*50 mg*) ..... for anti-stress support that guards against adrenal ascorbic acid depletion.
(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

..... dried aluminum hydroxide gel minimizes the possibility of gastric distress.

DOSAGE: *1-4 TEMPOGEN Tablets t.i.d. or q.i.d. (TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.) for one or two weeks. Then lower by 1 tablet every four or five days to maintenance level.*

SUPPLIED: *TEMPOGEN and TEMPOGEN Forte —in bottles of 100 Multiple Compressed Tablets. (TEMPOGEN Forte provides 2 mg. of prednisolone.)*

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

THREE pull straps control traction in model 430-EHS lumbo-sacral support pictured . . . two semi-rigid steels. WRITE for "Truform Red Book," the fully illustrated reference catalog of Surgical Supports and Elastic Hosiery.

TRUFORM

Please read this "detail", Doctor . . .
because it's what your favorite **Truform** fitter would tell you, we believe, if he or she visited your office . . .

Truform's educational program offers the finest training in the selection and fitting of *surgical* supports. **Truform** supports are designed on well-understood physiological principles, with a thorough understanding of the supportive or corrective effects to be attained. And there are a wide variety of designs to permit your selection of exactly the correct type to provide maximum therapeutic effect consistent with comfort.

TRUFORM Anatomical Supports are available only from the Ethical Appliance Dealer.

®TRUFORM

®TRUFORM The Professional Line ANATOMICAL SUPPORTS.

anatomical supports
3960 ROSSLYN DR., CINCINNATI 9, OHIO
BRANCHES: New York and San Francisco

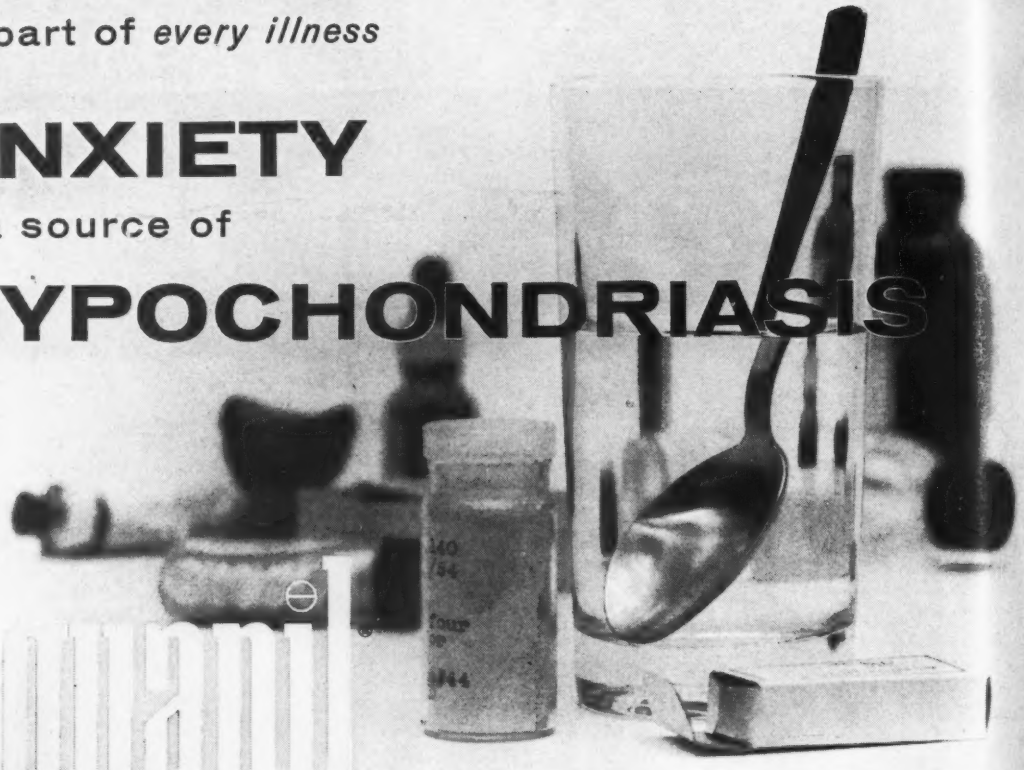
Vitamins
as nature provides them...
HOMAGENETS
better absorbed, better utilized
Homagenets provide, in tablet form, all the advantages of multi-vitamin drops. By a unique patented process, the vitamins are homogenized, then fused into a solid, highly palatable form. Homagenets supply vitamins in the same way as do the most nutritious foods.
Homogenization presents both oil and water soluble vitamins in microscopic particles. This permits greater dispersion of the vitamins—and consequently better absorption and better utilization.
THE ADVANTAGES OF
HOMAGENETS
Better absorbed, better utilized
Excess vitamin dosage unnecessary
Pleasant, candy-like flavor
No regurgitation, no "fishy burp"
May be chewed, swallowed or dissolved in the mouth
The S. E. MASSENGILL COMPANY • Bristol, Tennessee
New York • Kansas City • San Francisco

. . . part of *every illness*

ANXIETY

is a source of

HYPOCHONDRIASIS



Equanil®

MEPROBAMATE

(2-methyl-2-n-propyl-1,3-propanediol dicarbamate)
Licensed under U.S. Pat. No. 2,724,720

"Many neglected anxiety neurotics become a medical and social burden. Confirmed hypochondriacs fill our offices and clinics clamoring for intervention by the doctor. . . . They create instability and unhappiness at home and communicate their own anxiety to their intimates."[1]

Hypochondriasis is a manifestation of emotional unrest. EQUANIL relieves the patient's anxiety, lessens his muscular tension, encourages restful sleep[2], providing an improved attitude and wholesome rapport.

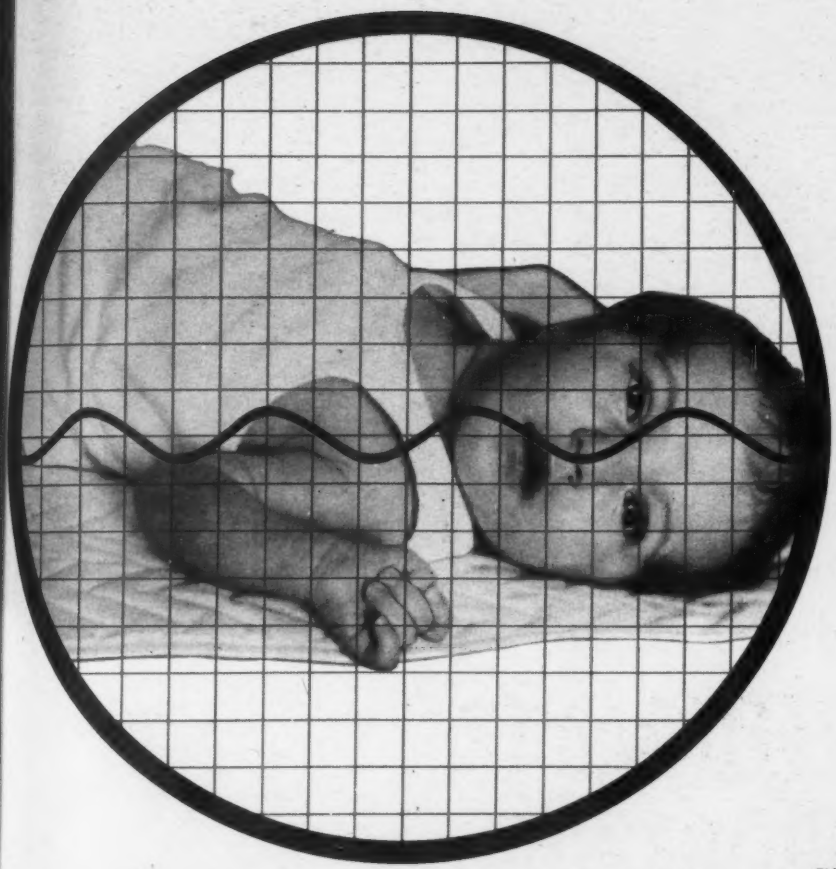
Supplied: Tablets, 400 mg., bottles of 50.

Usual Dose: 1 tablet, t.i.d.

1. Braceland, F.J.: Texas State J. Med. *51*: 299 (June) 1955.
2. Lemere, F.: Northwest Med. *54*:1093 (Oct.) 1955.

anti-anxiety factor with muscle-relaxing action

Wyeth®
Philadelphia 1, Pa.



BREMIL... clinical
counterpart of
breast milk for
the tranquil feeding
of normal infants

a nutritionally
complete formula
known by experience
to avoid
excoriated buttocks

minimize
digestive upsets *

avoid hyperirritability
caused by
subclinical tetany

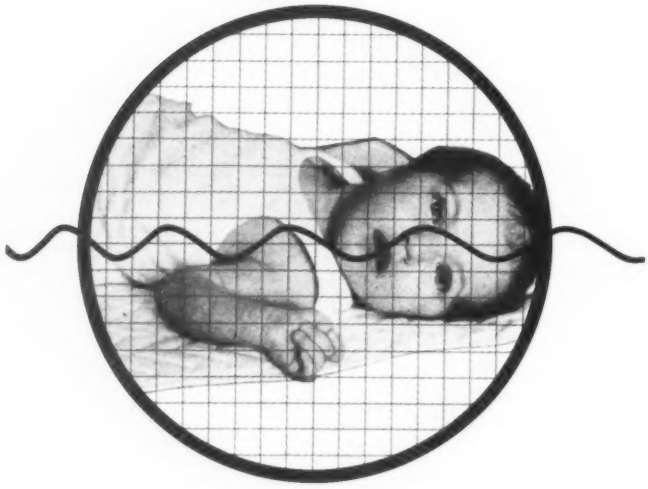
safeguard water
balance
during stress

promote sound
growth and development

natural tranquility... characteristic of babies fed

Borden's® **Bremil®**

*coo of a happy baby as recorded on an oscillograph



WHY BREMIL®-FED BABIES ARE TRANQUIL BABIES

BREMIL PROTEIN
PATTERNED AFTER BREAST MILK—
AVOIDS EXCORIATED BUTTOCKS
PERMITS LOW RENAL SOLUTE LOAD
EFFICIENT IN PROMOTING
TISSUE DEVELOPMENT

Babies fed BREMIL *receive "efficient" protein that ensures good growth without imposing the hazards of unnecessarily excessive or poorly utilized protein. In* BREMIL, *methionine and niacin (nutritionally interchangeable with tryptophan) have been added to create a pattern of sulfur-containing amino acids comparable to that of breast milk. Result—a kind of protein that avoids excoriated buttocks caused by ammoniacal urine,[1,2] and a protein level (1.5% by weight of formula) — that safeguards infants against dehydration and acidosis when stress of illness or heat imposes high extrarenal water loss.[3,4]*

BREMIL FAT
PATTERNED AFTER BREAST MILK—
MINIMIZES DIGESTIVE UPSETS

Babies fed BREMIL *receive a special blend of vegetable fats with "the same characteristics physically, chemically, and metabolically as breast milk."[5] About 50% of the fatty acids are unsaturated—and the resulting emulsion is finely divided—well tolerated, well digested, well assimilated.*

BREMIL ELECTROLYTE PATTERN
COMPARABLE TO BREAST MILK—
AVOIDS HYPERIRRITABILITY OF
SUBCLINICAL TETANY

In BREMIL, *mineral salts are adjusted to a pattern comparable to that of breast milk. The Ca:P ratio of 1½:1 is more nearly physiologic than cow's milk,[6] thus helping avoid hyperphosphatemia and hypocalcemia,[7] and the hyperirritability, enterospasm, and colic reported as characteristic of subclinical tetany.[8] The Na:K ratio (2.2:1) is identical to that of human milk, and chloride is at a low level.*

BREMIL "BUILT-IN" MULTIVITAMINS,
IRON, AND CARBOHYDRATE (LACTOSE)—
ELIMINATE MIXING ERROR
ASSURE COMPLETE NUTRITION

BREMIL-*fed babies do not require separate multivitamin or iron supplements under normal conditions. Vitamins A, D, C, thiamine, riboflavin, niacin, and iron levels are at or above recommended daily requirements.*

BREMIL—
EASY TO USE, TRULY ECONOMICAL

Standard dilution from birth—one measure of BREMIL *to 2 fl.oz. hot water. When shaken in hot water,* BREMIL *"becomes liquid" after a few seconds of stirring. And—because it is nutritionally complete—a* BREMIL *formula avoids waste, costs no more than ordinary formulas requiring carbohydrate and vitamin supplementation.*

Borden's®

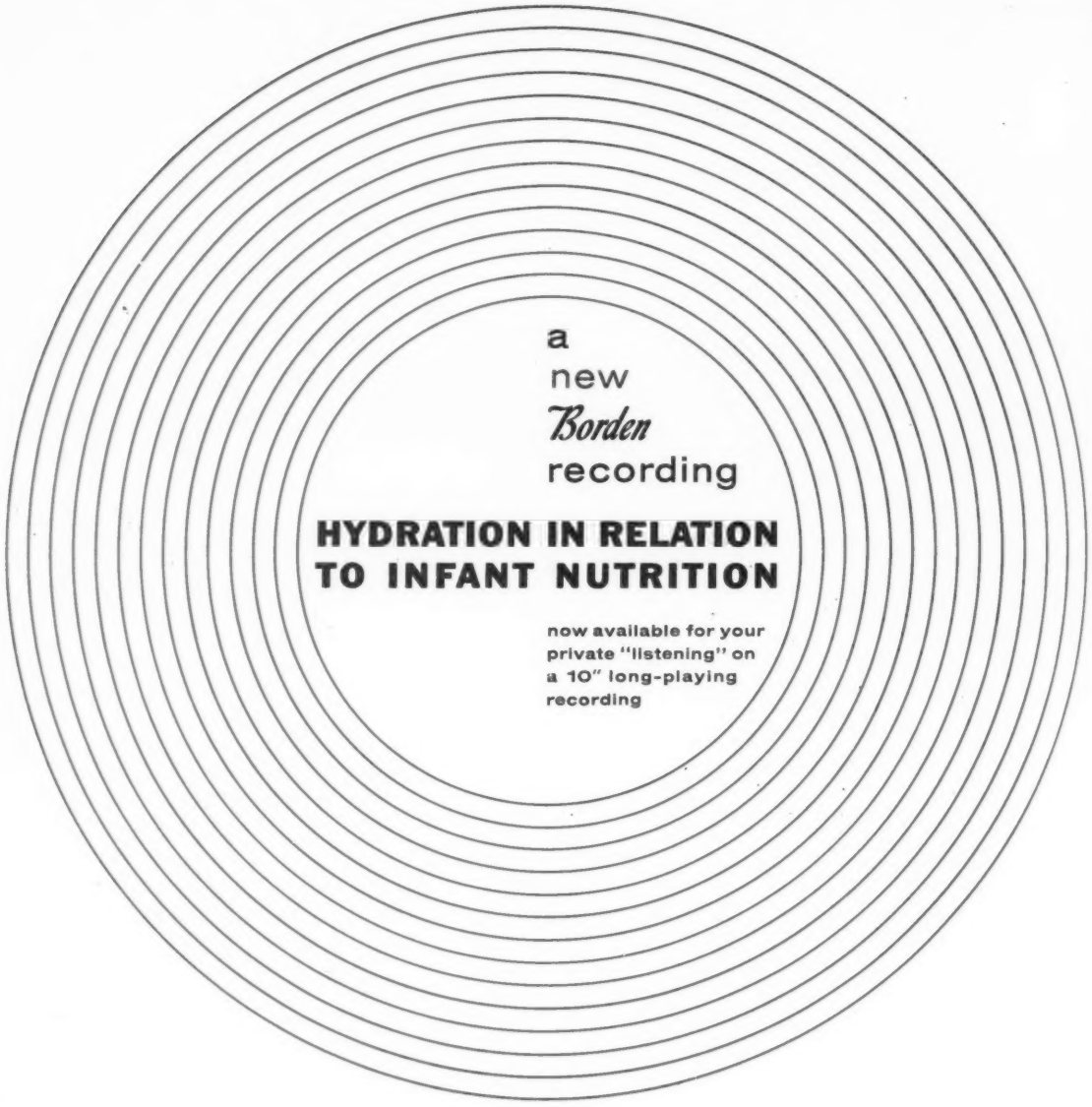
Bremil®

applying modern knowledge
of pediatric physiology

A PRODUCT OF BORDEN'S—MAKING MILK BETTER SINCE 1856

THE BORDEN COMPANY
PRESCRIPTION PRODUCTS DIVISION
350 MADISON AVENUE, NEW YORK 17

REFERENCES: 1. Goldstein, L. S.: Clin. Med. 59:455, 1952. 2. Oberman, J. W., and Burke, F. G.: M. Ann. District of Columbia 23:483, 1954. 3. Darrow, D. C.; Cooke, R. E., and Segar, W. E.: Pediatrics 14:602, 1954. 4. Pratt, E. L., and Snyderman, S. E.: Pediatrics 11:65, 1953 5. Litchfield, H. R.; Norton R., and Hoffman, C.: New York J. Med. 50:2067, 1950. 6. Gardner, L. I., et al: Pediatrics 5:228, 1950. 7. Gittleman, I. F., and Pincus, J. B.: Pediatrics 8:778, 1951. 8. Nesbit, H. T.: Personal communication, 1950.



How will a baby react to the stress of infection, gastrointestinal disturbance, a long hot spell? Does his formula influence his ability to withstand dehydration and subsequent acidosis?

Here is an area of current study in infant nutrition of interest to the day-by-day practitioner as well as the pediatric physiologist. You can hear an informal, informative discussion of the subject by leading investigators, simply by obtaining this new recorded "Borden Clinical Conversation Piece."

Write for your personal recording of *Hydration in Relation to Infant Nutrition.* Use your office stationery or prescription blank, and address your request to:

Dept. MJA
Borden's® Prescription Products Division
350 Madison Avenue, New York 17, N. Y.

another "medical communications service" provided to physicians by Borden's,® maker of BREMIL® for the *physiologic* feeding of normal infants

PRINTED IN U. S. A.

Introducing

A.P.C. WITH Demerol® Tablets

for more efficient

CONTROL OF *Pain*

Each tablet contains:			
	Aspirin	200 mg.	(3 grains)
	Phenacetin	150 mg.	(2½ grains)
	Caffeine	30 mg.	(½ grain)
	Demerol hydrochloride	30 mg.	(½ grain)

Average Adult Dose: 1 or 2 tablets
repeated in three or four hours as needed.

Bottles of 100 tablets. *Narcotic blank required.*

"Such a combination has proven clinically to be far more effective and no more toxic than equivalent doses of any of these used singly."*

Winthrop LABORATORIES
NEW YORK 18, N. Y.

*Bonica, J.J.; and Backup, P.H.: Northwest Med., 54:22, Jan. 1955.

Demerol, trademark reg. U.S. Pat. Off., brand of meperidine. – May be habit forming

IN EXURBIA TODAY—FAMILIES ARE PLANNED BIG

Spreading luxuriously beyond the suburbs is Exurbia, home of the authors of the nation's books, plays, advertisements, TV shows — and dreams. Today, a new phenomenon is part of the Exurbian scene: the *planned* big family. A recent survey of 29,494 college graduates shows men of the class of '45 have families *averaging 70% larger* than those of the class of '36 in the ten years after graduation.[1]

Assurance wanted — When Exurbanite wives seek advice on conception control to help them space their large families, they want to be sure the method you recommend *really* protects them.

Ideal method—Studies show diaphragm-jelly technique gives greatest degree of protection.[2] It is preferred for women of high parity who want large families — but only *when* they want them. Urban population groups using this method as recommended have an unplanned pregnancy only "once in ten to 15 years."[2]

Comfort important — With assurance goes comfort when you prescribe the RAMSES Diaphragm. Its cushioned rim guards against irritation; full flexibility permits easy movement. RAMSES® Jelly,* a "ten-hour jelly," used with the RAMSES Diaphragm, immobilizes sperm. Well tolerated. Effective for a full ten hours.

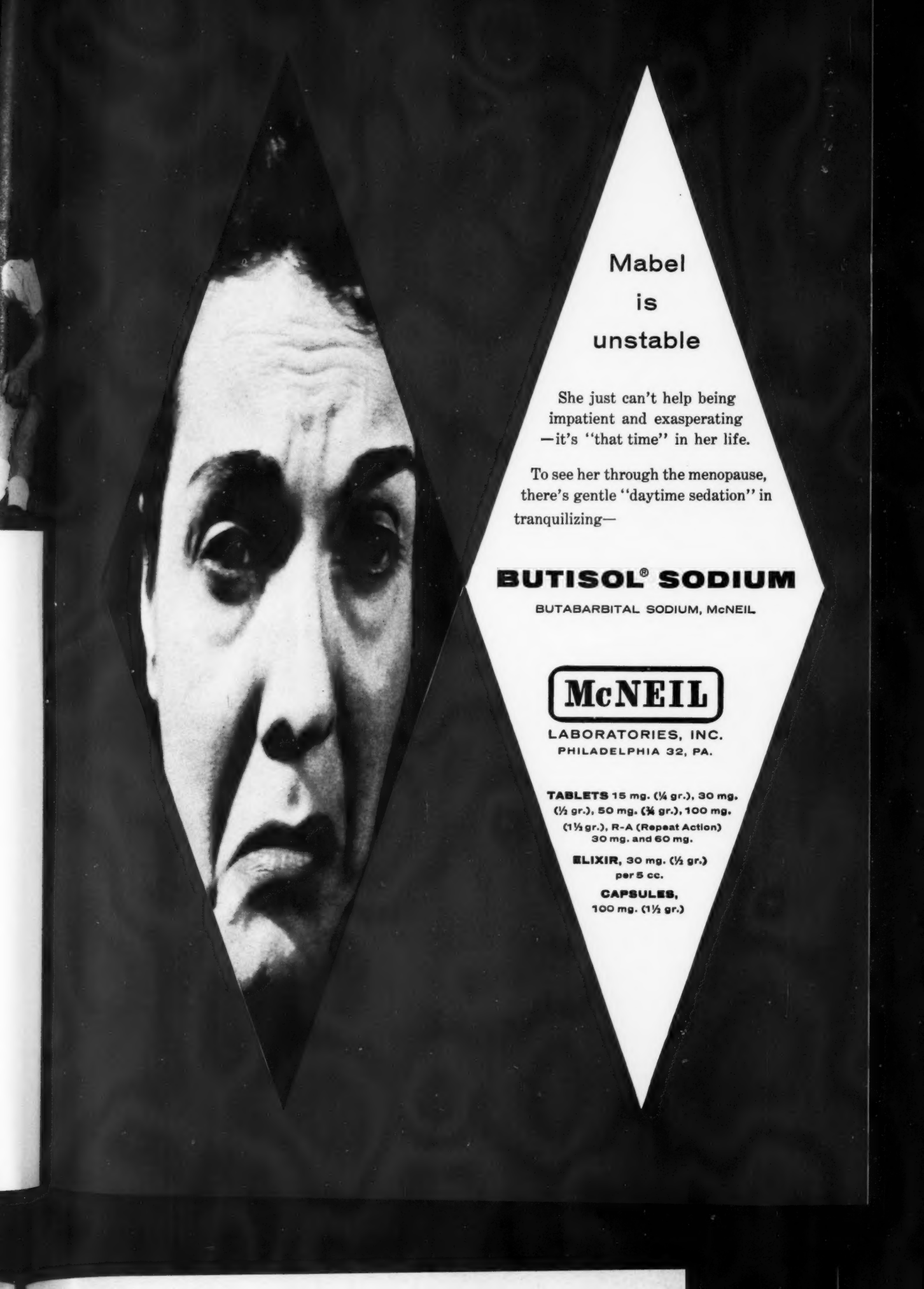
Neat TUK-A-WAY® *Kit* — Patients' confidence in your advice is confirmed when they learn that *for thirty years* physicians have relied on RAMSES Diaphragm and Jelly to help *plan* big families. RAMSES TUK-A-WAY Kit, #701 (diaphragm, introducer and jelly), Diaphragms 50-95 mm., Jelly in 3 and 5 oz. tubes.

1. College Study Report: Population Bulletin *11*:45 (June) 1955.
2. Tietze, C., in Dickinson, R. L.: Techniques of Conception Control, ed. 3, Baltimore, Williams and Wilkins Co., 1950, pp. 55-57.

*Active agent, dodecaethyleneglycol monolaurate 5%, in a base of long-lasting barrier effectiveness.

RAMSES and TUK-A-WAY are registered trade-marks of Julius Schmid, Inc.

JULIUS SCHMID, INC.
423 West 55th Street, New York 19, N. Y.


Mabel
is
unstable
She just can't help being impatient and exasperating —it's "that time" in her life.
To see her through the menopause, there's gentle "daytime sedation" in tranquilizing—
BUTISOL® SODIUM
BUTABARBITAL SODIUM, McNEIL
McNEIL
LABORATORIES, INC.
PHILADELPHIA 32, PA.
TABLETS 15 mg. (¼ gr.), 30 mg. (½ gr.), 50 mg. (¾ gr.), 100 mg. (1½ gr.), R-A (Repeat Action) 30 mg. and 60 mg.
ELIXIR, 30 mg. (½ gr.) per 5 cc.
CAPSULES, 100 mg. (1½ gr.)

"You try to scrub the bathtub with your back aching morning till night!"

"I don't know about bathtubs, but two days ago I couldn't reach a shelf higher than that."

"I thought maybe I slept in a draft. Never had a stiff neck like this before."

"That's nothing. I went around with my arm in a sling for nearly two weeks– had to sleep with a pillow at my back so I wouldn't roll over on it."

"I thought I was getting too old for high heels– low heels didn't help. My leg hurt down to the ankle."

"That's fun… I'm on my feet all da… but it was my arms t… bothered …

. . . safeguarded relief all the way across the…

Prednisone + Acetylsalicylic Acid + Aluminum Hydroxide + Ascorbic Acid

Potent corticosteroid anti-inflammatory action complemented by rapid… analgesia; doubly protected with antacid and supplemental vitamin C…

®T.M. SQ-J-466

"My back was so tight I couldn't even get on and off the bus; now I can climb stairs."

"I hope he helps my knee that quick."

"Take it from me, you should be glad you saw him early in the game so he could do some good."

"Good?— why, he's got me doing exercises I haven't done in years."

s the pread of common rheumatic complaints

Summated, protective corticoid-analgesic therapy

SIGMAGEN*

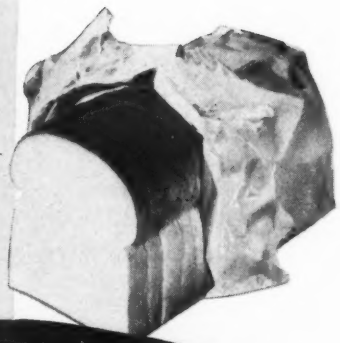
corticoid-analgesic compound **tablets**

- brings specific, complementary benefits to the treatment of muscle, ligament, tendon, bursa and nerve inflammation
- for the initiation of treatment of milder rheumatic disease
- for continuous or intermittent maintenance in more severe rheumatic involvement

Bottles of 100 and 1000.

Schering

The Well-Proportioned Nutrients in Enriched Bread



Equally Important in BLAND DIETS

WHETHER the bland diet is prescribed in peptic ulcer, gastritis, enteritis, colitis, or postoperatively, Enriched Bread fits the aims of the diet and at the same time provides a well-proportioned list of needed nutrients.

Enriched bread, plain or toasted, is bland in nature, soft and open in texture, and almost neutral chemically. The fresh appeal of enriched bread, its pleasant taste, and its easy blending with other foods, combine to give it a significant place in bland diets.

The added nutrients of enriched bread are selected qualitatively and quantitatively because of their importance in everyday nutrition. They have proved particularly advantageous when the intake of certain vitamin-bearing foods must be restricted.

Six average slices of enriched bread (containing 4% added nonfat milk solids) provide 12 grams of good quality protein (flour protein supplemented with milk protein), 0.36 mg. of thiamine, 0.26 mg. of riboflavin, 3.35 mg. of niacin, 3.5 mg. of iron, and 126 mg. of calcium.

These amounts represent from 16 to 29 per cent of the respective daily needs for good adult nutrition.

AMERICAN BAKERS ASSOCIATION
20 NORTH WACKER DRIVE · CHICAGO 6, ILLINOIS

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

the leading ethical laxative—**DORBANE,**

and Dioctyl Sodium Sulfosuccinate

have been combined to create...

unique, new

DORBANTYL*

the evacuant that both softens the stool and stimulates peristalsis

unique, new **DORBANTYL** combines —in proportions proved optimal by clinical trial[1]—

Dioctyl Sodium Sulfosuccinate (50 mg.)—the pharmacologically inert wetting agent that softens and swells hard fecal masses to help form a normal, easily-passed stool,[1,2,3] and

DORBANE (25 mg.)—the crystalline-pure peristaltic stimulant that gently and selectively prods the lower bowel into producing a natural, easy movement.[4]

unique, new **DORBANTYL has been clinically proved** both safe and effective, is "...a superior evacuant which retains the advantages of both component drugs without the disadvantages of either used alone."[1]

indications: DORBANTYL is indicated in acute and chronic constipation, whether organic or functional.

dosage: Adults, 2 capsules at bedtime; repeat if needed to cause bowel movement. If necessary, dosage may be increased or decreased to meet individual requirements. Children, 3 to 12 years, 1 or 2 capsules taken as above.

supplied: Bottles of 30 capsules and 250 capsules.

references: (1) Marks, M. M.: In press. (2) Antos, R. J.: Southwestern Med. *37*:236, 1956. (3) Wilson, J. L., and Dickinson, D. G.: J.A.M.A. *158*:261 (May 28) 1955. (4) Marks, M. M.: Am. J. Digest. Dis. *20*:240, 1953.

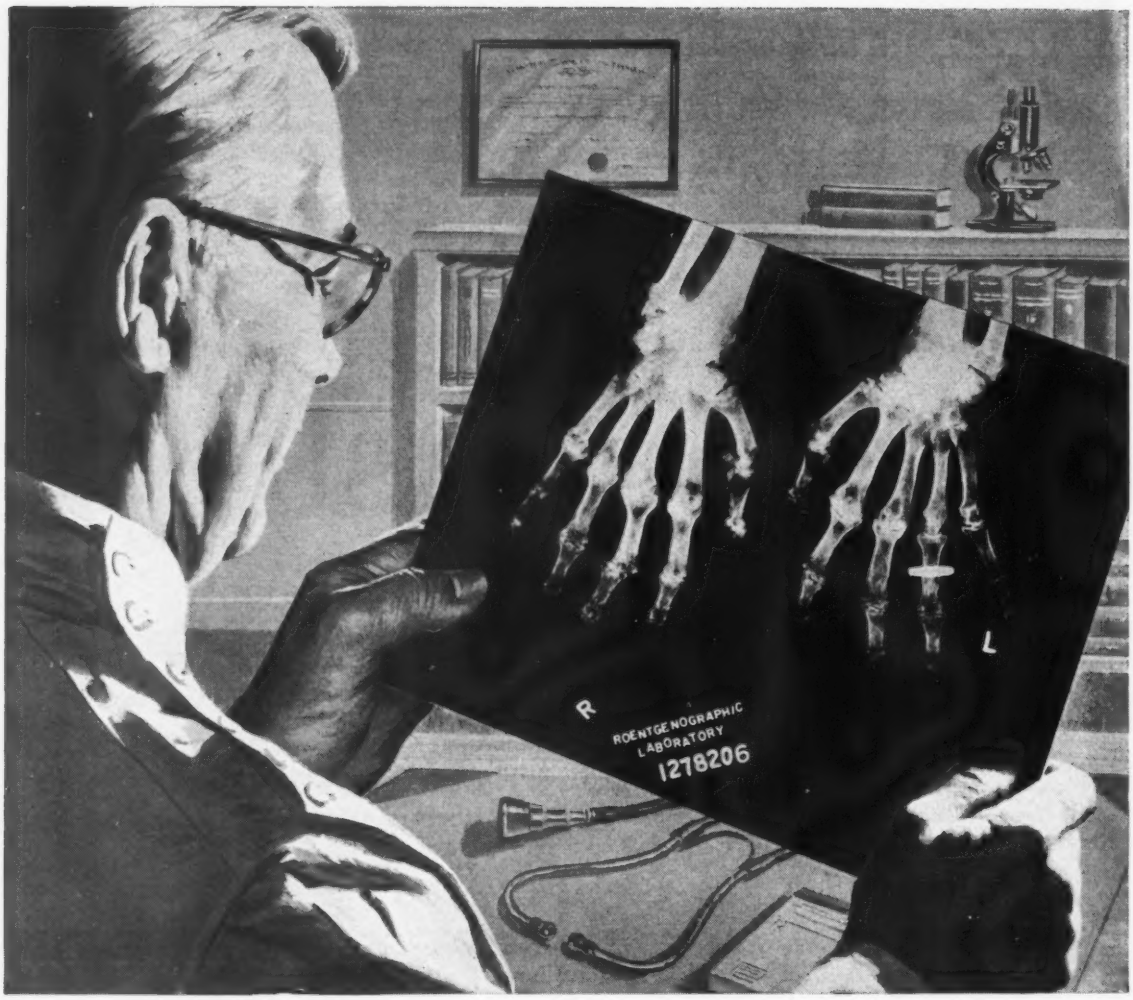
in occasional constipation or for more rapid response prescribe

DORBANE®

peristaltic stimulant
selective, persuasive, crystalline-pure
Scored tablets (75 mg.) and
Orange-flavored Suspension (37.5 mg. per 5-cc. tsp.)

DORBANE IS THE REGISTERED TRADEMARK OF SCHENLEY LABORATORIES, INC., FOR ITS BRAND OF 1,8-DIHYDROXYANTHRAQUINONE.
*DORBANTYL IS THE TRADEMARK OF SCHENLEY LABORATORIES, INC., FOR ITS BRAND OF DANTHRON WITH DIOCTYL SODIUM SULFOSUCCINATE. 40286

SchenLabs **SCHENLEY LABORATORIES, INC · NEW YORK 1, NEW YORK**



FLEXIBLE ARTHRITIS THERAPY with BUFFERIN®

Exploit fully the use of salicylates in arthritis—give steroids in minimal doses—combine salicylates with corticosteroids for additive antiarthritic effect—this is the program Spies[1] advocates in a recent article in the Journal of the American Medical Association.

Treatment of rheumatoid arthritis demands a "highly individualized program," Spies[1] writes. The additive action of salicylates permits use of smaller amounts of hormones, thus lessening or eliminating their well-known side effects. "A proper mixture of salicylates and corticosteroids produces an effective antirheumatic agent in many cases."[1]

Suit your treatment to your individual arthritic patient. Use the hormone you prefer, in the dosage you think best, but for better results combine it with BUFFERIN, the salicylate proved to be better tolerated by arthritics.[2]

BUFFERIN contains no sodium, a marked advantage when cardiorenal complications make a salt-restricted diet necessary.

Each BUFFERIN tablet contains 5 grains of acetylsalicylic acid and the antacids magnesium carbonate and aluminum glycinate.

REFERENCES:

1. J.A.M.A. 159:645 (Oct. 15) 1955.
2. J.A.M.A. 158:386 (June 4) 1955.

BRISTOL-MYERS CO., 19 West 50 Street, New York 20, N. Y.

if he's coughing:

AMBENYL

EXPECTORANT

AMBENYL EXPECTORANT has achieved an outstanding record for cough relief because it is equally effective in coughs occurring with colds and in those where allergy may be a factor. Comprehensive in formulation, AMBENYL EXPECTORANT includes selected demulcent and expectorant agents, **plus** Ambodryl,* for potent antihistaminic action, and Benadryl,* for antihistaminic-antispasmodic effect. These components promptly control frequency and severity of any uncomplicated cough because they: soothe irritated respiratory mucosa, make cough more productive, relax bronchial spasm, and relieve congestive symptoms.

AMBENYL EXPECTORANT contains in each fluidounce:

Ambodryl hydrochloride (bromodiphenhydramine hydrochloride, Parke-Davis)	24 mg.
Benadryl hydrochloride (diphenhydramine hydrochloride, Parke-Davis)	56 mg.
Dihydrocodeinone bitartrate	1/6 gr.
Ammonium chloride	8 gr.
Potassium guaiacolsulfonate	8 gr.
Menthol	q.s.
Alcohol	5%

Supplied in 16-ounce and 1-gallon bottles.

Dosage: Every three or four hours—adults, 1 to 2 teaspoonfuls; children, ½ to 1 teaspoonful.

MEDICAMENTA VERA

PARKE, DAVIS & COMPANY
DETROIT 32, MICHIGAN

In Constipation
NEW CONFIRMING CLINICAL RESEARCH

"...dioctyl sodium sulfosuccinate [Doxinate] results in restoration of normal function both in terms of stool consistency and frequency."

—CASS, L.J., AND FREDERIK, W.S.: AM. J. GASTROENTEROL. (DEC.) 1956.

"Our results indicate that effective fecal softening is generally adequate to permit correction of chronic constipation of the spastic type."

—FRIEDMAN, M.: AM. PRACT. & DIGEST OF TREATMENT (OCT.) 1956.

PARTICULAR CONDITIONS FOR DOXINATE THERAPY

- Spastic Constipation
- Anorectal Conditions
- Pregnancy
- Pediatrics

DOXINATE®

(DIOCTYL SODIUM SULFOSUCCINATE, **LLOYD**)

THE ORIGINAL DIOCTYL SODIUM SULFOSUCCINATE FOR TREATING CONSTIPATION

DOSAGE:

ADULTS—2 or 3 soft gelatin green 60 mg. capsules daily.

INFANTS—1 or 2 cc. Doxinate Solution 5% once daily in milk, formula or fruit juice.

"In the atonic group... the simultaneous use of mild laxation [Doxinate with Danthron]...is preferred...."

—FRIEDMAN, M.: AM. PRACT. & DIGEST OF TREATMENT (OCT.) 1956.

DOXINATE® WITH DANTHRON

PATENT PENDING

DOXINATE® WITH DANTHRON IS FREQUENTLY PREFERRED IN:

- Atonic Constipation
- Chronic Functional Constipation
- Geriatrics
- Pre- and Post-Surgery

Danthron (1,8-dihydroxyanthraquinone) is a mild, peristaltic stimulant acting only on the large bowel.

DOSAGE:

For adults and children over 12—one or two soft gelatin brown capsules (containing Doxinate, 60 mg.; Danthron, 50 mg.) at bedtime for 2 or 3 days or until bowel movements are satisfactory.

LLOYD BROTHERS, INC. · CINCINNATI 3, OHIO

"In the interest of medicine since 1870"

when blood pressure must come down

Feb. 1, 1956
Mrs. B.R. age 52 housewife
wt. 159 pulse 85 B.P. 218/116
Complains of "nervousness";
visual disturbances. Last seen
10/27/55 B.P. 180/94
Retina—slight nicking,
ordered c.v.c. and urinalysis
Rx Priming with Serpasil 0.5 mg. daily.
In few days stop Serpasil, start
Serpasil-Apresoline #2 one q.i.d.

Serpasil®-Apresoline®

hydrochloride

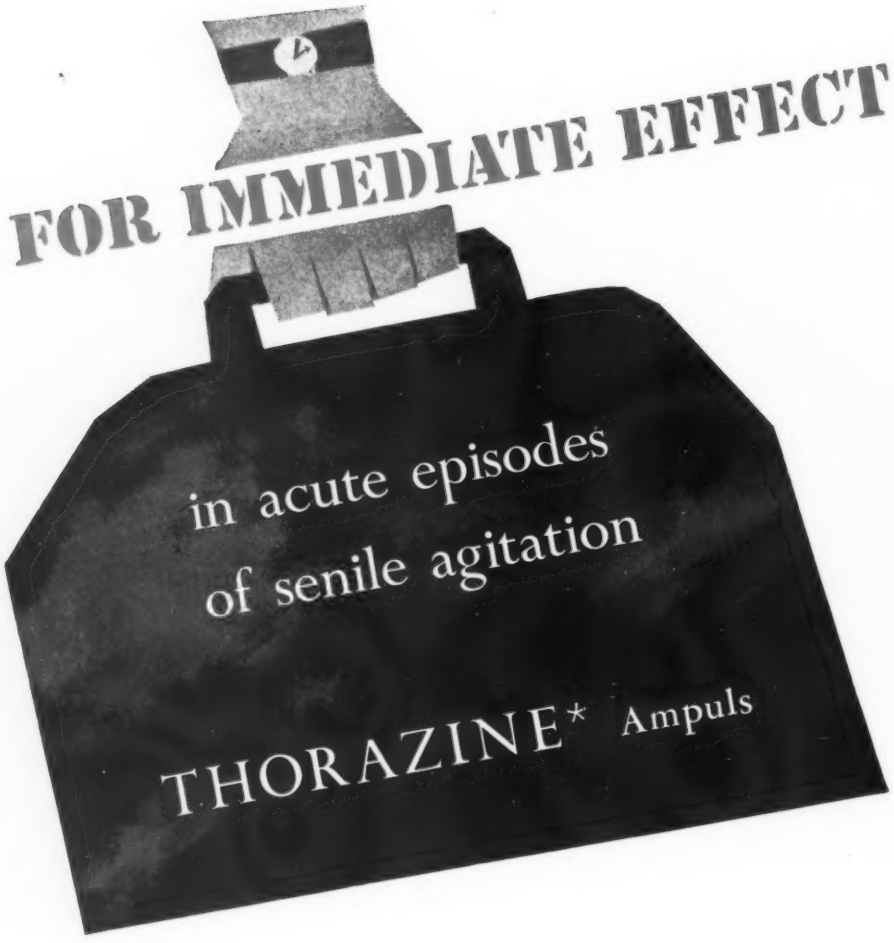
(reserpine and hydralazine hydrochloride CIBA)

When more than the central antihypertensive effect of Serpasil alone is needed to lower blood pressure, you will often see gratifying response to the combined antihypertensive action of Serpasil-Apresoline. And because Apresoline is effective in lower dosage when combined with Serpasil, there is a minimum of side effects.

NOTE: *All patients to be given Serpasil-Apresoline may benefit from priming therapy with Serpasil.*

CIBA
SUMMIT, N. J. 2/22893M

SUPPLIED: *Tablets* #2 (standard-strength, scored), each containing 0.2 mg. Serpasil and 50 mg. Apresoline hydrochloride; *Tablets* #1 (half-strength, scored), each containing 0.1 mg. Serpasil and 25 mg. Apresoline hydrochloride.

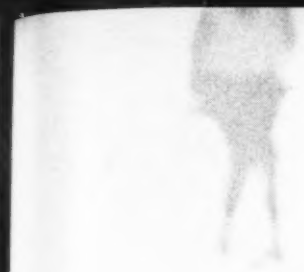


'Thorazine' should be administered discriminately and, before prescribing, the physician should be fully conversant with the available literature.

always carry 'Thorazine' Ampuls in your bag

Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.



it's the

"cold" season...

all ages • all stages • all coughs • respond to

CORICIDIN* *Syrup*

**a name synonymous with cold control*

one versatile preparation
with all the advantages of CORICIDIN
***plus* superior cough control**
in a pleasant-tasting syrup

Each teaspoonful (5 cc.) of
CORICIDIN Syrup* contains:

Dihydrocodeinone bitartrate	1.67 mg.
Chlorprophenpyridamine maleate	2 mg.
Sodium salicylate	225 mg.
Sodium citrate	120 mg.
Caffeine	30 mg.
Glyceryl guaiacolate	30 mg.

*Exempt narcotic.

Dosage: Adults—One teaspoonful every three or four hours not exceeding four doses daily. Children 6-12 years—One-half adult dosage. Younger children—Adjust dosage according to age.

Packaging: 4 oz., pint, and gallon bottles.

CORICIDIN® Syrup, brand of antitussive-analgesic.

Schering

CN-J-54

Old and Grumpy

—and somewhat hypertensive, he keeps himself in a fretful, nervous state—hard to get along with.

The gentle "daytime sedation" of Butisol Sodium will help him overcome some of the symptoms that come with aging.

BUTISOL® SODIUM

BUTABARBITAL SODIUM, McNEIL

McNEIL

LABORATORIES, INC.
PHILADELPHIA 32, PA.

TABLETS 15 mg. (¼ gr.), 30 mg. (½ gr.), 50 mg. (¾ gr.), 100 mg. (1½gr.), R-A (Repeat Action) 30 mg. and 60 mg.

ELIXIR, 30 mg. (½ gr.) per 5 cc.

CAPSULES, 100 mg. (1½ gr.)

For the Failing Heart

In Infants and Children

NEW

GITALIGIN® DROPS

Offers "greater safety margin"

GITALIGIN in a pleasant tasting form

Now whenever any of your little patients require digitalis therapy, give them GITALIGIN DROPS.

GITALIGIN, White's brand of amorphous gitalin, is unique among cardioactive glycosides because its therapeutic dose is approximately only ⅓ the toxic dose. In contrast, the therapeutic dose of other glycosides is approximately ⅔ the toxic dose.[1-11]

Precise fractional dosage made possible with GITALIGIN DROPS is especially advantageous in the management of advanced cardiac disease when the myocardial reserve is markedly limited.

Dosage:
In children the digitalizing dose is 0.05 mg. per pound of body weight, in divided doses: one-half initially, and the remainder is given in halves at 6 to 12 hour intervals. The maintenance dose usually is 1/10 the digitalizing dose.

Available:
In 30 cc. bottles with dropper calibrated to measure 0.05, 0.1, 0.2, 0.3, 0.4 and 0.5 mg. GITALIGIN.

Gitaligin Tablets;
0.5 mg. scored, in bottles of 30 and 100.

1. Am. Heart J. **52**:300 (Aug.) 1956.
2. Ann. Int. Med. **40**:820 (Apr.) 1954.
3. Am. J. M. Sc. **227**:188 (Feb.) 1954
4. Ann. Int. Med. **39**:1189 (Dec.) 1953.
5. Am. Heart J. **45**:108 (Jan.) 1953.
6. Am. Heart J. **46**:276 (Aug.) 1953.
7. Arch. Int. Med. **90**:224 (Aug.) 1952.
8. Circulation **5**:201 (Feb.) 1952.
9. New Eng. J. Med.**246**:225 (Feb.) 1952.
10. Am. Heart J. **42**:292 (Feb.) 1951.
11. Fed. Proc. **9**:256 (Mar.) 1950.

WHITE LABORATORIES, INC.
Kenilworth, New Jersey

Now 2 Polysal®s

FOR I. V. THERAPY

The addition of a new Polysal now provides balanced electrolyte solutions for both replacement and maintenance.

For REPLACEMENT

Polysal

(REGULAR)

Balanced in terms of plasma electrolyte content, this high sodium solution is ideal in the treatment of dehydrated and depleted patients by replacing lost sodium and affecting *immediate* improvement in blood volume and circulatory status.

Write for literature

SINCE CUTTER 1897

Simplify for Safety with

Polysal & Polysal-M

CUTTER LABORATORIES, Berkeley, California

*Talbot, N. B., Crawford, J. D., and Butler, A. M., "Homeostatic Limits to Safe Parenteral Therapy." New Engl. J. Med., 248, 1100 (1953).

For MAINTENANCE*

Polysal M

Balanced in terms of daily body needs for electrolytes, carbohydrates and water, this *Maintenance* solution is ideal for patients whose oral intake of food and water is restricted.

Polysal-M prevents the development of serious deficits which may occur in patients needing prolonged I.V. therapy by supplying the daily requirements in *safe amounts.*

"SAW-TOOTH" Effect Eliminated

This single solution delivers a smooth, uniform infusion, free from sharp peaks caused by daily infusion of several different-type solutions — thus preventing over-loading, water intoxication, edema formation.

The JOURNAL of the AMERICAN OSTEOPATHIC ASSOCIATION

Nov. 1956 Vol. 56, No. 3

The SOMATIC components of DISEASE*

RICHARD N. MacBAIN, D.O.
President, Chicago College of Osteopathy
Chicago, Illinois

THE FREQUENT STUDY and re-evaluation of osteopathic principles, practices, and concepts have been recognized needs and practices in our profession throughout its history. As a separate, independent profession in a numerical minority in the field of medicine, it has faced a continuing challenge to its existence. The challenge today, though somewhat different, is as great as it was in the 1890's or early 1900's. In its infancy, the threat to osteopathic survival came from its radical departure from the theories and practices of late nineteenth century medicine.

Today, in the mid-twentieth century, we see conformity as a danger to osteopathic independence and to its existence as a separate school. In the opinion of some observers, the two recognized branches of medicine have eliminated many of their differences, and the significance of those that remain is in question. The medical world of 1956 is vastly different from that of 1900 or even 1925. Does a school of practice whose claim to independence is based on its emphasis of the neuromusculoskeletal system make as great a contribution to the public health today, relatively, as it did 50 or 25 years ago?

The American Medical Association Committee[1] for the Study of Relations between Osteopathy and Medicine, on the basis of a survey made in 1955, said in its report:

> The sole fundamental difference in principle in the teaching of medicine in colleges of osteopathy and schools of medicine lies in the degree of emphasis placed upon the study of the musculoskeletal system and the application of manipulative therapy.

This is an understandable oversimplification, but we must agree it is fairly accurate, though limited, reporting. This paper proposes to review some of our knowledge and theories regarding this fundamental point of divergence between osteopathy and old-school medicine.

That our understanding of the nature and relation of the nervous, muscular, ligamentous, and other skeletal tissues to the disease process has been modified and broadened in recent years is obvious. The history of medical thought is one of continuous reorientation during that period of great medical discoveries which began in the late nineteenth century and has gone on without interruption since that time. Osteopathy has not stood still. There have been modifications and adaptations required of osteopathic thought, but they have been minor rather than basic.

In 1874, Dr. Still announced his observation that the skeletal tissues were subject to a variety of hitherto unrecognized stresses and strains from traumatic and other influences. He advanced the theory that these stresses and strains were either primary or secondary parts of the disease process and were significant etiologically, diagnostically, and therapeutically. In 1955, as quoted above, a group of medical observers noted that Still's followers were continuing to give what seemed to the observers particular emphasis and importance to these same stresses and strains.

Recognizing the basic consistency of osteopathy through 82 years of its history, we must also realize that some clarification and illumination of the earlier observations and experiences of our profession have taken place. Both relative emphasis and terminology have progressed and developed.

The term "somatic components of disease" in its present reference was first used by Korr[2] in 1948, and it has recurred in the titles and text of several papers from the Kirksville group since that time.[3,4] It is used as the title of this paper because it expresses the integral and ever-present nature of neuromusculoskeletal stresses and strains. The more familiar and more commonly applied terms "osteopathic lesion" and "osteopathic pathology" are synonymous, yet not so inclusive. The word "component" implies that these stresses and strains are a part of the disease process in all its phases. The older terminology in which common medical terms are qualified by the word "osteopathic" as in "osteopathic lesions," "osteopathic pathology," and "osteopathic diagnosis and treatment" requires orientation and explanation for those not accustomed to thinking osteopathically. The "osteopathic" terms have served us well in focusing our own thought but have added to the difficulties of communication with other scientific groups. They may, in a minor way, have delayed a broader understanding and acceptance of our contribution to medicine.

The third component

There are three components of disease: the visceral, the psychic, and the somatic. The processes through which they have come to be identified are of interest.

The science of pathology began with the study of the morphologic cellular tissue changes associated with disease. These changes are the terminal stages of the morbid process and are observed at surgical removal or postmortem. The studies are confined almost exclusively to viscera so that the consideration of the changes occurring in vital organs in degenerative and in terminal diseases have dominated medicine. Organic visceral disease has been considered of primary importance in

*Keynote Address delivered at the Sixtieth Annual Convention of The American Osteopathic Association, New York City, July 16, 1956.

diagnosis and therapy. Medical thought is and has been "organ oriented" with two results:

1. Functional disorders tend either to be unrecognized or considered of no importance to the true scientist who is absorbed in making his clinical opinion coincide with findings at surgery and autopsy.

2. Concentration on the study of visceral disease caused the neglect of those studies dealing with the relative importance of the psychic and the somatic functions and tissues. Emotional and psychic problems, together with symptomatology referable to the skeletal tissues, have been considered only when they have been major, easily recognizable, and of such intensity that they could not be ignored. Wherever possible, they have been classified as secondary to visceral disease.

Although psychic and somatic problems have been assigned a secondary role by medicine, their frequency has stimulated interest in the phenomena of referral of symptoms and referral of functional disturbances from points of primary involvement to other areas and systems of the body.

Studies of referred pain and reflex contracture were begun by Ross,[5] Head,[6] and Mackenzie,[7] who originated the concept of viscerosomatic reflexes. The subject has attracted the interest of a growing number of investigators, particularly those concerned with understanding the mechanism of pain. The data and the theories resulting from these studies on symptoms referred to the somatic structures have made an important contribution to our understanding of the integrating functions through which body unity is maintained.

The development of modern psychiatry and the recognition of psychosomatic and other psychogenic symptomatology have further stimulated interest in the mechanisms of referral and the organ systems through which they are effected. Modern psychiatry represents the first major break in medicine away from the arbitrary confines of the idea of the sole primacy of visceral-organic disease. As a result, general medicine has largely accepted the interdependence, the inter-reaction, and the inter-relationship of the visceral and the psychic components of disease. Each or either is considered capable of a dominant role but some element of both is usually accepted as present in most clinical problems.[8] Thus has one part of the concept of body unity, mediated through the nervous system, come to be adopted by clinical medicine.

That both the visceral and psychic components are integrated with the skeletal somatic tissues has been recognized by all schools of practice, but in general medicine the skeletal tissues have been assigned a secondary and passive role in relation to the other two. That the skeletal tissues have been studied as secondary reactors is indicated by current medical terminology: "viscero-somatic reflexes," "referred pain," "reflex contractions," and "psychosomatic" and "psychogenic pain." Reference to somatovisceral reflexes is rare in nonosteopathic literature. The possibility that the skeletal tissues might at times play a dominant role is seldom recognized in medical writing or clinical study.

Historically, the growth of osteopathy as a profession has roughly paralleled in time the gradual reorientation in medical thought which recognizes functional disease as clinically important and which assigns to the skeletal tissues a part, although a passive and limited one, in the disease process. Thus modern medicine accepts body unity and its clinical application to a limited extent.

Osteopathy has always recognized the clinical importance of the concept of body unity and has applied it specifically and with emphasis to the relation of the somatic skeletal tissues to viscera. It assigned to the skeletal tissues a place of active and dynamic influence in the disease process—a place which makes them of equal relative importance with the visceral and psychic components in pathogenesis and morbidity, if not in mortality.

Livingston[9] has said that in many clinical syndromes there undoubtedly may be a combination of somatic, visceral, and psychic irritants, with each contributing to the central process, regardless of whether they represent primary or secondary factors.

As the sole proponent of a completely unified response of the body to disease, including an active and positive role for the skeletal tissues, the osteopathic physician has shown a surprisingly modest degree of the tendency toward overemphasis of his viewpoint that has characterized many pioneers in new fields of medical development.

To the osteopathic physician belongs the distinction of recognizing and seeking a proper evaluation of the role of "the third component," the somatic component, which is interactive with the other two, visceral and psychic, and like them capable of dominance in circumstances frequently encountered in clinical medicine. The somatic component completes the triad of components mentioned previously.

Functional nature of somatic components

I suggest that many of the difficulties in understanding the somatic components of disease have come from a tendency to describe them structurally and morphologically rather than functionally. A review of osteopathic literature fails to reveal any great uniformity in diagnosis, in the recording of findings, and in the relation of the somatic components to various types and groups of disease. What we term the "osteopathic lesion" has not yet been described in a way to permit such uniformity. It is possible that what we have tried to describe as characteristics of the lesion have been incidental to it, rather than of its essence.

In 1917 a group of definitions of the osteopathic lesion by such authors as Hulett, Tasker, McConnell, Clark, and Ashmore was presented in an introductory chapter to Bulletin No. 4 of the A. T. Still Research Institute.[10] The definitions showed the divergent ideas of these early writers.

Also in this bulletin it is stated:

> Very few records are to be found which give the results of a study into the essential tissue changes occurring in those slight structural perversions called variously "bony lesions," "osteopathic lesion," or "vertebral lesion." Much has been written concerning the supposed nature of these changes, but, so far as now appears from a study of the literature, little study has been made of the pathology. Even the tissue changes occurring in ordinary dislocations and sprains have failed to receive proper study anywhere, and the changes occurring in subluxations and in the other classes of structural perversion have received practically nothing in the way of systematic study.

Denslow[3] has stated:

> The term "osteopathic lesion" has been placed in quotation marks since, although the recognition and treatment of this entity has been at the very core of the work and development of the osteopathic profession, general agreement as to its exact nature and its anatomical, physiological, and pathological characteristics has not yet emerged.

A preoccupation with the search for tissue changes and positional changes in areas of lesion was characteristic of our profession in its formative years. The

early osteopathic physicians began their experience with and studies of the lesion at a time when the cellular pathology of Virchow occupied much of the attention of medicine. There was a consistent search for objective changes, gross and microscopic, that could be identified with disease processes. Medical contemporaries of the early osteopathic physicians were impressed by and concentrated on "organic disease."

It was only natural then that a structural description of the newly recognized neuromusculoskeletal factors should be sought. Since these factors so frequently involved joints and their supporting tissues, the positional changes of the bones entering into the joint appeared, to early students, to be of prime importance, and to supply an objective frame of reference for identification and description. The terms "structural maladjustments," "subluxation," "malrelationship," and the like came to be indicative of osteopathic thinking.

It was thought that some trauma of varying degrees of severity and duration forced these structures into maladjustment where they remained until suitably treated. They were "put back in place," "corrected," "realigned," et cetera. Again the terms used in therapy indicated the concept of pathologic structural relationships rather than functional change. The words used described something tangible, objective, and understandable and in terms familiar at that time.

The result was that the altered anatomic relationships (usually minor in nature) frequently found on palpation of joints which give other evidence of the stresses and strains described by Dr. Still became established as criteria of the lesion and considered of its essence. Much thought has been given to efforts to identify and classify the somatic components of disease in terms of altered anatomic relationships, expressed as alterations of, or fixations in, one or more of the normal movements of the joint concerned.

It soon became evident that the functional disturbances and effects of the Still lesion bore little if any relationship to the degree of altered anatomic position. In fact, there was almost an inverse ratio, since gross and long-established anatomic deformities could be symptom free while what were apparently the most minor alterations, anatomically, produced marked clinical reactions. This disparity between structural malrelationship and functional effects did not discourage, until recently, persistent efforts to study and record osteopathic findings in terms of positional change. The result has been many samples of structural examination sheets, none of which has been used for very long.

While these altered relationships are not the essence of the lesion, an ability to recognize them and evaluate them still remains one of the basic skills required of the osteopathic physician. It is indispensable in the diagnosis and treatment of many of the functional disorders in the musculoskeletal system in which positional changes help to indicate the nature and degree of the functional change. These findings are indicative, however, rather than determining, and they rest on individual interpretations which do not permit objectivity from independent observers.

The search for objectivity in the lesion had another influence on osteopathic development. That second influence was the search for morphologic tissue changes, identifiable microscopically, in areas of lesion. This led to a series of tissue studies of traumatically injured vertebral joints in laboratory animals, usually rats, guinea pigs, and rabbits.[10] These traumatized tissues showed simple, noninfective inflammatory changes in the immediate post-traumatic period. The findings were generally consistent.

Observations made some time after injury of laboratory animals (weeks and months) showed less characteristic findings. Some injured joints had fibrositic degeneration of muscles, thickening of ligaments, and degeneration of cartilage. In others with negative findings, the observers presumed that recovery had occurred through "spontaneous correction."

The similarity of the tissue changes observed in traumatized laboratory animals and in humans rests on reasonably sound conjecture. Palpation of these animal spines at the point of injury showed minor positional changes of the bones of the joint, restrictions of mobility, and some edema and swelling of tissues. These palpatory findings were similar to those found in humans in vertebral joints diagnosed as being "in lesion." In the immediate post-traumatic acute stage the edema and swelling were more marked than in the chronic stage when tissues tended to be contracted and firmer (fibrositic) in both animals and humans. Because of these similarities the findings seen in traumatized laboratory animals were accepted by osteopathic physicians as probably the same as those occurring in humans at points of lesion.

So, today, as in 1917 we are still writing and talking about the "supposed" tissue changes in humans. Tissue studies of simple traumatic injuries to joints and other human skeletal tissues are no more abundant today than in 1917, in either osteopathic or medical literature. A few efforts to observe cellular changes in cases diagnosed as fibrositis have been made under medical auspices.

Bonica[11] has reported confusion as to what constitutes fibrositis and records also a recommendation that the term "fibropathic syndrome" be substituted. The existence of fibrositis is doubted by many because "usually there is a lack of histologic evidence." (The concept of organic disease must be served.)

Other writers do find some inflammation of the muscles and their attachments with infiltration of inflammatory cells, some hyperplasia of white fibrous tissue, fibroblastic nodules, interfascial adhesions, and localized muscle spasm.

Practically, no consistent pattern of morphologic change has been established for the somatic components of disease. In trauma, an acute inflammatory change is probably present, but this would be self-limiting and would heal spontaneously without the presence of some other factor. Korr[1] has suggested that a certain pattern is organized by the nervous system to produce what is termed "the osteopathic lesion." Since chronic tissue changes follow injury to skeletal tissues in some instances and are absent in others in both laboratory animals and humans, some explanation other than the simple reaction of inflammation must be found.

These considerations lead to the suggestion that the somatic components of disease represent a functional disturbance of the normal activities of the supporting, the contractile, and the pressure-bearing tissues of the neuromusculoskeletal system. They are the functional response of these tissues to stress of any kind, whether that stress is traumatic, psychogenic, or reflexly transmitted from other primary factors in the viscera. The sequelae of these functional changes may include a variety of manifestations which come from the functional change but do not cause it—positional changes, restricted mobility, edema, later fibrositis, et cetera. These are all incidental to the response to stress as it is organized by the nervous system. They

are determined not only by the force and duration of the stress but by preceding influences on the involved tissues and neural pathways.

A definition of the osteopathic lesion given by W. A. Schwab to his classes 25 years ago was "a maladjustment of structure which perverts physiology." Could that not now be rephrased, with a change of emphasis, to "a maladjustment of structure caused by perverted physiology"? Even trauma must first pervert the physiology in order to prevent spontaneous recovery. Actually, of course, structure and function cannot be separated.

The functional nature of the somatic components of disease has been considered at length because its recognition will:

1. Lead to clarification of osteopathic diagnostic records with principal emphasis on the identification of functional changes in tissue rather than positional change.

2. Make for more effective manipulative treatment when it is realized that corrective measures must reach function primarily and structure secondarily.

3. Promote realism in osteopathy by recognizing that many supposed characteristics of the lesion, particularly morphologic tissue changes, which we have failed to demonstrate over many years, may frequently be nonexistent or are end-results rather than causes when they are present.

4. Give a more dynamic conception of the somatic components and their ability to dominate the response of the organism to stress.

5. Direct research along productive lines similar to those which are being followed at Kirksville and Kansas City, and are being begun at Los Angeles, in studying functional changes in areas of osteopathic stress and strain.

6. Lead to a more careful evaluation and interpretation of current literature and its contribution to a better understanding of osteopathic principles.

Somatic components and pathogenesis

Osteopathy has at times been challenged to "prove" that disease is caused by the functional pathologic disorders under discussion in this paper. Many observers with only a superficial knowledge of our science reason that if appropriate treatment to the somatic components of disease produces a favorable clinical response then, per se, these components must have caused the disability and the relationships should be capable of proof. That this is an oversimplified approach to the study of pathogenesis is apparent. It is characteristic of the etiologic concept.

Galdston[12] has said that we live in the age of etiological medicine which had its origin in bacteriology and has evolved with it.

The etiologic era has been characterized by a consistent search for as many specific causes for as many diseases as possible. The purpose of this etiologic approach has been to find means of prevention and to develop a therapeutic attack on the causative agent when its presence has been identified clinically. In other words, eliminating the cause will cure the disease. Etiological medicine has many successes to its credit, particularly in some of the infectious diseases. It has only limited usefulness in others, and even less in degenerative and neoplastic fields.

Osteopathic thought was influenced by this etiological trend, and a number of theories were advanced in our profession as to the presence of a causative relationship between certain areas and types of skeletal stresses and strains and systemic and organic disease or diseases. Once again observations on the viscera of laboratory animals whose vertebral articulations had been traumatized were undertaken and some interesting observations made.[13-15] At present there has been no general acceptance of the relationship established between mechanically injured vertebral joints of laboratory animals and functional and morphologic changes in the animals' viscera. Some additional effort was made to collect clinical statistics on humans which might establish an etiologic relationship between areas and types of skeletal strain and certain clinical entities. It has also been difficult to find consistency in this approach up to the present, possibly because it may rest on a doubtful premise as well as being handicapped by lack of uniform terminology.

All osteopathic physicians with experience in somatic tissue diagnosis and treatment recognize the presence of skeletal changes in a wide range of disorders. I suggest that the sustaining and amplifying roles of these skeletal changes, together with their tendency to exaggerate the impact of other factors, may outweigh in importance their etiologic significance.

The specific etiological concept is giving way, in general medicine, to an appreciation of what may be termed "stress factors." The change will be gradual, not abrupt. Old concepts are not given up nor new ones adopted quickly. From the transition, a practical meeting ground for the two ideas will be found.

Beyond a minority of diseases with markedly specific etiologies, attention is more and more directed toward the manner in which an individual responds to noxious factors in the environment. The particular nature of the individual response to stress is at times an equal, or at other times a greater, determinant of the clinical entity that develops than the stress itself. The individual in all the complexities of heredity, social, and physical environment, past injuries, and experiences becomes the key to pathogenesis rather than does the stress factor which happened to be most recently operating on him.

This means that etiology is multiple and combined, many times the accumulation of a number of factors appearing in sequence over some period of time. The clinician is not always able to weigh the relative significance of trauma, infection, psychogenic strain, and the like, so the important element becomes the individual's own adaptability and resistance. In many common diseases of the circulatory, digestive, nervous, and glandular systems, the texts list so many possible etiologies or combinations of etiologies as to throw doubt on the importance of any of them.

In the midst of such complexity of possible causes it is unreasonable to expect to define for the somatic components a specificity and an exactness that we expect of very few of the other noxious influences known to produce physiologic stress. Even in the field of trauma and posture, where pathologic skeletal changes could most readily be expected to be specific and localized, we are confronted with such a variety of individual responses that, in all but severe and major injuries, the simple reaction of skeletal tissues to direct force immediately becomes complicated by the total reaction of the individual.

It is not without reason, then, that our efforts to establish a selective and specific role for the lesion have not been successful. The somatic components are but one of a number of conditioning factors influencing the response to stress. No osteopathic physician will

question their importance. That they are clinically frequent and often dominant in determining the direction and nature of the response to stress is apparent to those who recognize them and treat them.

However, too little emphasis has been placed on a possibly more significant role of the somatic components in pathogenesis and in therapy—that is, their tendency to set up, through the intricate segmental and higher reflex mechanisms which they activate and which activate them, a sustained, self-perpetuating, and often self-accelerating cycle. If an opinion based on clinical experience may be permitted, I venture to state that the somatic tissues have the ability to maintain a state of untreated or uncorrected functional imbalance for a long time and with considerable dynamism. Trends in the literature support this view.

Livingston[9] has suggested that the concept which he proposed for the pain mechanism in causalgia may be applicable to pain associated with various disorders, including visceral, somatic, and psychic conditions. He has stated that an organic lesion at the periphery, involving sensory nerve filaments, may become a source of chronic irritation. From this trigger point afferent impulses eventually create an abnormal state of activity in the internuncial neuron centers of the spinal cord gray matter. In turn, the internuncial disturbance is reflected in an abnormal motor response from both the lateral and anterior horn neurons of one or more segments of the cord. The muscle spasm, vasomotor changes, and other effects which this central perturbation of function bring about in the peripheral tissues may furnish new sources of pain and new reflexes, thus creating a vicious cycle of activity.

Long after an immediate or precipitating factor in viscera may have been overcome or have been compensated for, the associated response of the skeletal tissues, particularly the vertebral joints, may be self-perpetuating and continued. From its role as a secondary or incidental component of the body's reaction to stress, the somatic component often progresses to a place of dominance in the clinical picture, a place toward which treatment must be directed.

Recognition of the role of skeletal stress and strain in perpetuating and amplifying the response to all stress contributes to an appreciation of its clinical importance. Recognition of the limitations of the specific etiological concept, both as it applies to a variety of stress factors and to the osteopathic lesion itself, will contribute to a more fundamental appreciation and understanding of our science.

The spectrum of diseases in which a favorable response to osteopathic treatment has been and may yet be achieved is broad. Understanding and acceptance by objective observers of these favorable results of treatment cannot be conditional on the finding of a simple etiologic connection between the skeletal components and the disease in question. The importance of these skeletal components of disease increases as their wider influence, particularly in treatment and recovery, is understood through what Livingston[9] calls "the vicious circle concept."

Somatic pain

Pain in the skeletal tissues is a major clinical problem and is recognized as such. Its exact clinical frequency is not easily established because it does not lend itself to statistical treatment. It has its origins principally in functional rather than organic disturbances, and classification by objective methods is difficult. Also many physicians have a limited knowledge of and interest in this phase of practice, chiefly because they are not equipped by training to deal with it. It is discussed here as one indication of the clinical frequency of the somatic components.

A recent article in a lay magazine said of backache that in all probability this ailment causes more general discomfort than any other medical problem except the common cold.[16]

Bonica[11] has grouped pain along the distribution of spinal nerves, myofascial pain, and arthralgia or joint pain as among the most common problems confronting the clinician. Other writers join in giving pain in the skeletal tissues a high priority of clinical incidence. This is done in spite of a wide diversity of views regarding pain and differentiation of its various types.[17]

A few trends in the consideration of skeletal pain are of interest. Pain in the musculoskeletal system may have its origin in three areas, the viscera, the psyche, and the somatic tissues themselves. Medical opinion has shifted from the viscerogenic to the psychogenic as the most frequent and important source of somatic pain, until recently there has appeared to be a realization that the somatic tissues themselves are responsible for much of the pain felt in them.

Following the work of Ross,[5] Head,[6] Mackenzie,[7] and later investigators, referred pain of visceral origin was widely thought to be the explanation for most somatic pain where the skeletal tissues themselves showed no infectious, traumatic, degenerative, or neoplastic lesions demonstrable on objective examination. There was a period when much abdominal surgery was undertaken primarily for the relief of back pain. The study and analysis of the back itself was neglected while the search for visceral disease was pursued with vigor, because in the minds of most clinicians and surgeons functional pain from the back itself was nonexistent.

Unsatisfactory therapeutic results from surgery, together with more investigation of somatic pain by other investigators, have changed the perspectives. Judovitch and Bates[18] have said:

> In the chest and abdomen segmental pain and tenderness may simulate the pain of visceral disease, and many patients who have submitted to medical treatment and surgical procedures are not relieved of pain until treatment is directed to the somatic origin and its cause. Following surgery, the pain may persist or become even worse.

McHenry[19] has pointed out that chronic pain, apparently related to viscera, often disappears with proper orthopedic treatment of body mechanics. Chapman[20] has questioned the validity of several hypotheses relating to referred pain and has emphasized the frequent somatic source of skeletal pain.

While the frequency of pain diagnosed as referred has diminished substantially, and much more care is exercised in its identification than was the case 20 years ago, the majority still recognize visceral pain referred to somatic structures as a clinical fact. The subject is confused and confusing because of the number of different views advanced to explain its mechanism. Again the majority appear to favor the existence of a central excitatory state (area of facilitation) either at the segmental level, in the internuncial pool, or in the cerebrum itself.

Somatic pain of psychogenic origin is the province of the school of psychosomatic medicine. The overemphasis that accompanies new conceptions in medicine appears to have had free rein here. When the visceral explanation of somatic pain came into question, pain

for which no explanation could be found in organic and objectively demonstrable disease of the skeletal tissues or viscera was then often termed "psychogenic in origin" and treated as such in general medicine.

That there is some influence of psychogenic factors on the skeletal tissues is generally accepted. But its usual effect is to exaggerate or exacerbate an already established functional or organic change rather than to initiate it. Here again statistics are not satisfactory, but Weiss and English[8] reported on a combined clinic, in which a psychiatrist participated, for the handling of low back cases. Of 300 cases of low-back complaint, only twenty-seven were classified as neuropsychiatric in origin. Bonica[11] reported a number of opinions ranging from those which attribute all cases of "fibrositis" to psychosomatic factors to those which place the syndrome on a purely physical basis. In the face of this great diversity of opinion, the osteopathic physician can only advance his experience to support his impression that somatic pain is usually classified as psychogenic in origin predominantly by those whose training has not included an understanding and a recognition of the effects of fatigue, of tensions, and of other strains to which the back, with its upright posture, is subjected. The diagnosis of psychosomatic pain is usually made by default and by those who have a limited understanding of the musculoskeletal system and its weaknesses.

The predominantly somatic origin of somatic pain has long been recognized by the osteopathic physician, and his record (again statistics are not available) in therapy attests to the soundness of his concept. Havemann[16] reports the conclusion that practically all backache is functional, the fault of muscles and ligaments that are working badly. Of 1,000 cases of the difficult and persistent type, 60 per cent were attributed to muscular strain or ligamentous sprain and 30 per cent to chronic fatigue.

Weiss and English's[8] statistics mentioned above attributed 262 of 300 cases of low-back pain to causes as follows: posture, osteoarthritis, acute low-back disturbances, myositis, undiagnosed or deferred diagnosis, and miscellaneous causes.

Bonica,[11] in addition to labeling problems of neuralgia, myofascial disease, and joint pains as among the most common confronting clinicians, has listed as their principal causes influences which affect the skeletal tissues directly, such as trauma, postural strain, overexertion of muscles, chilling, and fatigue, while at the same time recognizing their functional nature and the usual absence of histologic change.

These few illustrations show the primacy given to purely somatic functional disorders by these authors in contrast to the former referred pain and psychogenic concepts which have not stood the test of clinical experience. Referred pain and psychogenic pain are still important in clinical medicine, but their relative importance and frequency have been minimized as somatic causes have become understood.

Somatic pain is one phase of the study of the somatic components of disease that has gained some understanding outside of osteopathic circles, but there are as yet only scattered indications in the literature of any appreciation of the integration of these components with visceral and psychic diseases in an active and, at times, a commanding role.[21] That still remains the unique and distinct province of osteopathy. Osteopathy will probably ultimately share that distinction with general medicine as it now shares its more advanced concepts of somatic pain.

Summary and conclusions

Andrew Taylor Still[22] said in his autobiography, "Its [osteopathy's] applications may be more thoroughly understood, but the philosophy is eternally the same." I have discussed some of the applications of that philosophy as it has applied to the supporting, protective, and motor and sensory skeletal tissues and given to them an important and significant role in health and disease.

The somatic tissues are one of three components of disease whose inclusion in the triad of visceral, somatic, and psychic factors makes the clinical application of the concept of body unity a reality. They are functional and dynamic, not static, degenerative, and passive. Their part in pathogenesis is active, particularly as perpetuators and accelerators of the response to stress organized in them by the nervous system. Their most commonly understood manifestation to date is in the realm of somatic pain. The search for their true place in medicine is just beginning. It will involve a challenging volume of laboratory and clinical study with a type of organized direction that our profession has not yet developed.

The laboratory should, first, provide methods of measuring and recording the functional changes which are the osteopathic lesion and, second, contribute something to the study of the integrating mechanisms which coordinate visceral, psychic, and somatic functions. Two osteopathic laboratories, at Kirksville and Kansas City, are working in these fields, and work is being started at Los Angeles. There should be at least three more groups with essentially the same interest and much greater support.

The clinic must provide simple methods of identifying and recording the functional changes in the muscles, skin, and fascia, which are the somatic components in disease. Controlled and comparative studies in diagnosis and therapy will follow.

Osteopathy is the school of medical practice which recognizes and emphasizes the role of the somatic components of disease. That is the reason for its existence. It began and was sustained in its trying early days by a sense of mission, the conviction of a great contribution to medicine. Part of that contribution has been made, but only a small part. The sense of mission needs to be preserved. The challenge that remains is bigger than ever, so big in fact that other groups with more resources than we have may be the ones to meet it first. If they do, our purpose is accomplished. But until that purpose is accomplished, we must grow in strength, in independence, and in pride in our special and distinctive philosophy, training, and skills.

To be practical about it, let us see that we recognize and emphasize the role of the somatic components in individual practice, in our service institutions, and in our teaching clinics and hospitals. That we can all do. That has been the basis of osteopathic strength, and it remains the principal means by which the resources to meet our challenge will be provided. Let us capitalize on our distinctive and unique place in therapy, and our conformity will take care of itself.

5250 S. Ellis Ave.

References

1. Report of committee for study of relations between osteopathy and medicine. J. Am. M. A. 158:736-742, July 2, 1955.

2. Korr, I. M.: Emerging concept of osteopathic lesion. J. Am. Osteop. A. 48:127-138, Nov. 1948.

3. Denslow, J. S.: Approach to skeletal components in health and disease. J. Am. Osteop. A. 50:399-403, April 1951.

4. Korr, I. M.: Somatic approach to disease process. J. Am. Osteop. A. 51:201-205, Dec. 1951.
5. Ross, J.: On segmental distribution of sensory disorders. Brain 10:333-361, 1887-1888.
6. Head, H.: On disturbances of sensation with especial reference to pain of visceral disease. Brain 16:1-33, 1893; or 17:339-480, 1894.
7. Mackenzie, J.: Some points bearing on association of sensory disorders and visceral disease. Brain 16:321-354, 1893.
8. Weiss, E., and English, O. S.: Psychosomatic medicine. Ed. 2. W. B. Saunders Co., Philadelphia, 1949.
9. Livingston, W. K.: Pain mechanism. Macmillan Co., New York, 1943.
10. A. T. Still Research Institute: Pathology of vertebral lesion. Bull. no. 4. Chicago, 1917, p. 24.
11. Bonica, J. J.: Management of pain. Lea & Febiger, Philadelphia, 1953.
12. Galdston, I.: Meaning of social medicine. Harvard University Press, Cambridge, Mass., 1954.
13. A. T. Still Research Institute: Further contributions to study of effects of lumbar lesions. Bull. no. 5. Chicago, 1917.
14. A. T. Still Research Institute: Study of certain growth changes due to vertebral lesions in rabbits and other mammals. Bull. no. 6. Chicago, 1926.
15. A. T. Still Research Institute: Changes in body fluids due to vertebral lesions. Bull. no. 7. Chicago, 1931.
16. Havemann, E.: Mystery and misery of backache. Life 40: 151-152, June 11, 1956.
17. Davis, P. B.: Differentiation of visceral and somatic pain. Clin. Osteop. 51:763-774, Dec. 1955.
18. Judovitch, B., and Bates, W.: Pain syndromes. Ed. 3. F. A. Davis Co., 1949.
19. McHenry, T. L.: Body mechanics and the surgeon; pseudo-surgical pain syndromes. J. Am. Osteop. A. 53:373-377, March 1954.
20. Chapman, R. J.: Visceral pain as considered by neuro-surgeon. J. Am. Osteop. A. 54:426-428, March 1955.
21. Gutstein, R. R.: Review of myodysneuria (fibrositis); role of myodysneuria in cutaneous vasomotor disturbances including menopausal hot flashes, sebaceous and sudatory abnormalities; review of role of abdominal and dorsolumbar triggers in functional gastro-intestinal diseases. Am. Pract. & Digest Treat. 6:570-577, April 1955.
22. Still, A. T.: Autobiography. Published by the author, Kirksville, Mo., 1897, p. 221.

Practical application of BLOOD VOLUME determination*

JOSEPH F. DePETRIS, D.O.
Dallas, Texas

IN THE HOSPITAL management of the sick patient, clinical problems related to the adequate maintenance of the fluid as well as the cellular components of the circulation are continually encountered. Patients have at times received inadequate replacement therapy, but equally serious have been the times when excessive use of blood, plasma, or fluid has had deleterious effects on the patient.

It has been customary to rely on the hematocrit findings, the hemoglobin and serum protein levels, or "clinical judgment" to arrive at the correct solution to these problems. These values are only concentration measurements; and in the presence of fluid and protein shifts between the vascular and extravascular compartments, they do not give a correct estimate of the actual circulating blood volume. Extensive clinical investigation has demonstrated that the Evans blue dye hematocrit method affords a practical, reliable, and reproducible clinical method for estimation of the total blood volumes with less than 5 per cent error.[1-9] With the use of this procedure both qualitative and quantitative replacement of blood volume deficit may be done more accurately than with other methods in the small hospital. Separation of the individual component deficits, as is depicted in Table I, will facilitate the proper administration of replacement therapy.

The six most common conditions in which abnormalities of blood volume are encountered are: (1) acute hemorrhage, (2) compensated anemia, (3) syndrome of chronic shock, (4) hemoconcentration, (5) hydremia, and (6) absolute polycythemia.

Acute hemorrhage with simultaneous loss of plasma and erythrocytes demonstrates the fallacy of using the hematocrit findings, percentage of hemoglobin, and erythrocyte count for the estimation of the blood loss. These values remain normal for many hours following hemorrhage. Following a latent period of 3 to 4 hours after hemorrhage, plasma volume begins to increase, reaching a peak in 3 days in adequately hydrated patients.[4,10] At this time hematocrit findings would indicate the presence but not the magnitude of erythrocyte deficit. In contrast to the rapid replacement of plasma volume, replacement of major depletion of erythrocyte volume by hematopoiesis is severely limited and may take several weeks.[4,10] Studies with blood volume indicate the quantity of whole blood required to prevent development or continuance of shock.

The patient who has chronic bleeding or destruction of erythrocytes beyond his hematopoietic compensating powers will have his blood volume maintained by plasma replacement as described above. Here again the hematocrit findings will indicate only the presence

TABLE I—TOTAL BLOOD VOLUME DETERMINATION

Weight	Normal	kg.
	Present	kg.
Height		cm.
Hemoglobin		gm.
Hematocrit		vol. %
Total serum protein		gm.
Total blood volume	Normal	cc.
	Present	cc.
	Deficit	cc.
Total plasma volume	Normal	cc.
	Present	cc.
	Deficit	cc.
Total red cell volume	Normal	cc.
	Present	cc.
	Deficit	cc.
Total hemoglobin volume	Normal	gm.
	Present	gm.
	Deficit	gm.
Total circulating protein volume	Normal	gm.
	Present	gm.
	Deficit	gm.
Total body protein	Normal	gm.
	Present	gm.
	Deficit	gm.

*Presented at the Eastern Study Conference of the American College of Osteopathic Internists, Philadelphia, March, 1955.

of and not the magnitude of deficits of erythrocyte volume.

A state of chronic shock[11] has been described in which the usual 1:3 ratio of plasma volume to interstitial fluid volume is altered because of the decrease in plasma and increase in interstitial fluid seen in the chronically ill patient. This is brought on by the depletion of tissue proteins accompanying weight loss, which is eventually reflected in the serum proteins. The reduced oncotic pressure of the plasma together with the reduction of tissue tension allows abnormal amounts of fluid to leave the vascular compartment to enter the interstitial compartment. If anemia is present it may be masked by this tendency of hemoconcentration. Hematocrit and serum protein level determinations will give no indication of the large deficits which may be present.

Hemoconcentration from dehydration and the hydremia seen in pregnancy, cirrhosis of the liver, congestive heart failure, renal insufficiency, and following excessive fluid therapy may be more accurately evaluated with the Evans blue dye procedure. The differentiation of relative from absolute polycythemia is also more readily accomplished when this method is used.

Blood volume determination has found its greatest use in the preparation and postoperative study of the surgical patients. Today it is generally agreed[1,2,11-13] that it is mandatory to maintain an adequate total blood volume and its relative constituents to prevent and eradicate the medical catastrophe known as shock. Recent evidence using blood volume studies shows that reduction in blood volume in shock patients is fully accounted for without assuming general leakage of plasma from the circulation because of increased capillary permeability.[14,15]

In cases of hemorrhage and skeletal trauma, the train of events leading to shock is initiated by a large reduction in blood volume.[11,14] An acute reduction of from 30 to 40 per cent in the circulating blood volume is followed within 1 or 2 hours by the appearance of the characteristic symptoms of shock.[2,11,13,15]

One must not lose sight of the fact that a clinical picture of shock always means diminished blood volume. In cerebrogenic, cardiogenic, and adrenogenic shock, blood volume may be normal[16] or increased.[17-23]

The surgically significant feature of reduced blood volume is an increased susceptibility to shock, correctible by transfusion replacement of the blood volume deficit.

Preoperative blood volume studies should be done in all patients who have chronic disease, in the geriatric patient, where acute or chronic blood loss has occurred, in dehydrated patients, and in the poor-risk patient. It has long been recognized that blood volume depletion occurs in patients with neoplastic disease.[11,24,25] Here the major change is in the reduction in the total erythrocyte volume and hemoglobin.[2,11]

Studies on operative and postoperative blood loss, using the Evans blue dye method, have shown that the previously used gravimetric and colorimetric methods are inadequate and that the loss is greater than usually found by the latter methods.[4]

The circulating protein deficit is an index of the body protein deficit, the latter being thirty times the former. It further indicates disturbances in protein metabolism such as inadequate intake, poor absorption, and faulty utilization. The ill effects of reduced levels of circulating protein have been known for many years.[6] Calculation of such deficits by the methods outlined gives warning that edema of an anastomotic stoma, delayed wound healing, and dehiscence may occur.

The quantitative replacement of blood volume deficit preoperatively and correction of excessive operative losses during or following surgery will almost eliminate operative and postoperative shock,[11,12,24,26-28] widen the scope of surgery, and lower morbidity and mortality. Postoperative convalescence has been rapid in patients thus treated as compared with the recovery of many patients not receiving the benefit of replacement.

If the plasma volume and erythrocyte volume are equally diminished, the use of whole compatible blood is suggested. When the deficit in blood volume is due to a lowered erythrocyte and hemoglobin volume, replacement by means of erythrocytes in suspension may be desirable, especially in cases in which overloading of the circulation is a consideration. Replacement of plasma volume is accomplished with human plasma or plasma substitutes. If a deficit in total circulating protein exists, human serum albumin may be added. It must be remembered that a small deficit in a small individual is just as serious as a large deficit in a large individual.

In a patient with peritonitis, after 8 or more hours a 20 to 30 per cent reduction in plasma occurs, with only a small reduction in erythrocyte volume.[29]

In the therapy of acute gastrointestinal hemorrhage in which a large volume of whole blood is often needed over a period of a very few hours, the use of blood volume estimation is very effective in the more accurate appraisal of the patient. Here again the concentration tests are grossly misleading as plasma compensation does not have time to occur to alter the hematocrit reading.

In the severely burned patient, blood volume deficit is due predominantly to plasma loss, so that hemoconcentration occurs. The fluid therapy of burns at present is in a state of confusion.[29-33] Saline, plasma, plasma substitutes, and whole blood are being used in varying combinations. Vascular compartment evaluation will give a more rational approach as to the way in which these modalities of replacement may be more accurately applied to the individual patient.

In contrast to the edematous patient with normal pregnancy, blood volume study has shown that the severely pre-eclamptic or eclamptic patient who develops edema is apparently unable to maintain protein concentration in step with the increase in plasma volume. Because of this failure, as plasma dilution occurs, plasma protein concentration and, hence, plasma oncotic pressure fall.[33,34] This lowered oncotic pressure decreases glomerular filtration and is a factor in the production of oliguria. The use of concentrated serum albumin may aid in relieving oliguria in these cases by increasing the glomerular filtration rate and urine formation.[35] Similarly the lowered oncotic pressure due to a decrease in the total circulating serum protein seen in nephrosis,[36] long-standing hepatic disease, starvation, and congestive heart failure may be more properly estimated and replacement provided, if necessary, when compartment study is carried out.

At present, controversy exists as to the state of the blood volume in the patient with congestive heart failure. Certain studies have indicated that hypervolemia exists because of an increase in the circulating erythrocyte mass, the plasma volume, or both.[17-23] Other reports suggest that there is no significant increase in the circulating blood volume of patients with congestive heart failure in comparison with that of

controls.[16] This discrepancy appears to be the result of reports of no change when only tagged erythrocytes were used, and based on the assumption that the total body relative cell volume is identical with the peripheral vessel hematocrit reading. More recent studies in which erythrocyte and plasma volumes were determined independently have shown that mean values for erythrocyte volumes and plasma volumes were elevated above those of control subjects and fell with compensation.[23] These studies have been done in patients who have not been in a state of congestive heart failure for long periods. It has been my experience that in the patient who has uncompensated congestive heart failure with resulting hepatic and gastrointestinal edema, severe deficits in erythrocyte volume may often occur. This may be accompanied by a deficit in the total circulating and body protein, producing reduced oncotic pressure of the plasma. It is felt that both result from prolonged edema interfering with absorption of food constituents needed for hemtopoiesis and serum albumin production.

Severe anasarca resulting from oliguria has been studied in ten patients who had been in a state of congestive heart failure for months and years. Hyponatremia and hypochloremia were not present. These patients had been digitalized and had become "diuretic fast." Arrhythmias, vitamin deficiency, hyperthyroidism, and infectious disease were not aggravating factors. Studies showed severe deficits in the total blood volume, predominantly due to erythrocyte deficit. In some, the total circulating protein was lowered. The anemia present was of the hypochromic normocytic or microcytic type. Replacement therapy was accomplished with small transfusions of packed erythrocytes, 250 cc. per day, correcting up to 1,500 cc. of erythrocyte deficit in some cases. Prompt and profuse diuresis occurred in all cases.

This diuresis is presumed to have been the result of increased myocardial and renal efficiency resulting from the relief of the existing anemia. Following this, the cases under study again responded to diuretic therapy and sodium restriction. With the edema state being more properly controlled and the patients maintained on a high protein, iron-supplemented diet, they are better able to maintain normal hematopoiesis and albumin formation. The number of cases so treated is as yet too small to permit drawing any definite conclusions, but the findings are being presented as a stimulus to the use of blood volume study and replacement in the patient with advanced cardiac failure accompanied by uncontrollable, unresponsive edema formation.

Summary

In this presentation of the clinical application of blood volume determination, it has been shown how the previously used concentration tests, erythrocyte count, hematocrit reading, and hemoglobin and serum protein determinations may be disastrously misleading in the sick patient. More thorough vascular compartment study with individual blood constituent determination as described will allow more accurate qualitative and quantitative replacement therapy.

35 Brookhollow Dr.
Route 5

References

1. Beling, C. A., Morton, T. V., and Bosch, D. T.: Blood volume and other determinations in preoperative and postoperative care; their practical applications in the average hospital. Surg., Gynec. & Obst. 87: 163-171, Aug. 1948.

2. Noble, R. P., and Gregersen, M. I.: Blood volume in clinical shock; mixing time and disappearance rate of T-1824 in normal subjects and in patients in shock; determination of plasma volume in man from 10-minute sample. J. Clin. Investigation 25:158-171, March 1946.

3. Gregersen, M. I.: Practical method for determination of blood volume with dye T-1824; survey of present basis of dye-method and its clinical applications. J. Lab. & Clin. Med. 29:1266-1286, Dec. 1944.

4. Stanton, J. R., *et al.*: Blood and "available fluid" (thiocyanate) volume studies in surgical patients; operative and postoperative blood loss with particular emphasis upon uncompensated red cell loss. Surg., Gynec. & Obst. 89:181-190, Aug. 1949.

5. Brady, L. W., *et al.*: Blood volume studies in normal humans. Surg., Gynec. & Obst. 97:25-32, July 1953.

6. Root, W. S., Roughton, F. J. W., and Gregersen, M. I.: Simultaneous determination of blood volume by CO and dye (T-1824) under various conditions. Am. J. Physiol. 146:739-755, Aug. 1946.

7. Bersen, S. A., and Yalow, R. S.: Use of K^{42} or P^{32} labeled erythrocytes and I^{131} tagged human serum albumin in simultaneous blood volume determinations. J. Clin. Investigation 31:572-580, June 1952.

8. Gibson, J. G., Jr., and Evans, W. A., Jr.: Clinical studies of blood volume. J. Clin. Investigation 16:301-316, May 1937.

9. Schultz, A. L., *et al.*: Critical comparison of T-1824 dye and iodinated albumin methods for plasma volume measurement. J. Clin. Investigation 32:107-112, Feb. 1953.

10. Lyon, R. P., *et al.*: Blood and "available fluid" (thiocyanate) volume studies in surgical patients. Surg., Gynec. & Obst. 89:9-19, July 1949.

11. Clark, J. H., *et al.*: Chronic shock: problem of reduced blood volume in the chronically ill patients. Ann. Surg. 125:618-646, May 1947.

12. Nelson, W., Clark, J., and Lindem, M. C.: Blood volume studies in depleted surgical patient; clinical applications. Surgery 28:705-715, Oct. 1950

13. Reeve, E. B.: Quantities of blood lost by grossly injured men within few hours of wounding. Ann. N. Y. Acad. Sc. 55:351-366, Sept. 1952.

14. Tobias, C. A., *et al.*: Elimination of carbon monoxide from human body with reference to possible conversion of CO to CO_2. Am. J. Physiol. 145:253-263, Dec. 1946.

15. Noble, R. P., and Gregersen, M. I.: Blood volume in clinical shock; extent and cause of blood volume reduction in traumatic, hemorrhagic and burn shock. J. Clin. Investigation 25:172-183, March 1946.

16. Ross, J. F., *et al.*: Blood volume in congestive heart failure. Tr. A. Am. Physicians 65:75-87, 1952.

17. Gibson, J. G., Jr., and Evans, W. A., Jr.: Clinical studies of blood volume; changes in blood volume, venous pressure, and blood velocity rate in chronic congestive heart failure. J. Clin. Investigation 16:851-858, Nov. 1937.

18. Warren, J. V., and Stead, E. A., Jr.: Fluid dynamics in chronic congestive heart failure; interpretation of mechanisms producing edema, increased plasma volume and elevated pressure in certain patients with prolonged congestive failure. Arch. Int. Med. 73:138-147, Feb. 1944.

19. Kaplan, E., *et al.*: Blood volume in congestive heart failure as determined with iodinated human serum albumin. Am. Heart J. 47:824-838, June 1954.

20. Meneely, G. R., and Kaltreider, N. L.: Study of volume of blood in congestive heart failure; relation to other measurements in fifteen patients. J. Clin. Investigation 22:521-530, July 1943.

21. Nylin, G.: Blood volume determination with radioactive phosphorus. Brit. Heart J. 7:81-84, April 1945.

22. Nylin, G., and Hedlund, S.: Weight of red blood corpuscle in heart failure determined with labelled erythrocytes during and after decompensation. Am. Heart J. 33:770-795, June 1947.

23. Schrieber, S. S., *et al.*: Blood volume alterations in congestive heart failure. J. Clin. Investigation 33:578-586, April 1954.

24. Ewing, J.: Neoplastic diseases: a treatise on tumors. Ed. 4. W. B. Saunders Co., Philadelphia, 1940.

25. Morton, T. V., Jr., Siegel, R. I., and Schulte, H. A.: Blood volume deficits in carcinoma of colon. Am. J. Surg. 83:170-172, Feb. 1952.

26. Abbott, W. E., and Mellors, R. C.: Total circulating plasma proteins in surgical patients with dehydration and malnutrition. Arch. Surg. 46:277-288, Feb. 1943.

27. Evans, E. I.: Significance of blood volume alterations in surgical patients. South M. J. 38:214-221, March 1945.

28. Theron, P. H., and Wilson, W. C.: Blood changes in peritonitis. Lancet 1:172-178, Jan. 29, 1949.

29. Evans, E. I., *et al.*: Fluid and electrolytic requirements in severe burns. Ann. Surg. 135:804-815, June 1952.

30. Millican, R. C., Tabor, H., and Rosenthal, S. M.: Traumatic shock in mice; comparison of survival rates following therapy. Am. J. Physiol. 170-179-186, July 1952.

31. Millican, R. C., *et al.*: Traumatic shock in mice; acute hemodynamic effects of therapy. Am. J. Physiol. 170:187-195, July 1952.

32. Rosenqvist, H., and Thorsen, G.: Macrodex in treatment of extensive burns. Arch. Surg. 62:524-531, April 1951.

33. Strauss, M. B.: Observations on the etiology of toxemias of pregnancy; relationship of nutritional deficiency, hypoproteinemia, and elevated venous pressure to water retention in pregnancy. Am. J. M. Sc. 190:811-824, Dec. 1935.

34. Freis, E. D., and Kenny, J. F.: Plasma volume, total circulating protein, and "available fluid" abnormalities in preeclampsia and eclampsia. J. Clin. Investigation 27:283-289, March 1948.

35. Orloff, J., Welt, L. G., and Stowe, L.: Effects of concentrated salt-poor albumin on metabolism and excretion of water and electrolytes in nephrosis and toxemia of pregnancy. J. Clin. Investigation 29:770-780, June 1950.

36. Luetscher, J. A., Jr., Hall, A. D., and Kremer, V. L.: Treatment of nephrosis with concentrated human serum albumin; effects on renal function and on excretion of water and some electrolytes. J. Clin. Investigation 29:896-904, July 1950.

CARDIAC ARREST

Medicolegal and therapeutic responsibilities of anesthetists, surgeons and general practitioners*

J. DONALD SHEETS, D.O., F.A.C.O.S.
Highland Park, Michigan

On January 28, 1848, in Boston, a teenage girl was put to sleep with chloroform for the surgical removal of a toenail. Her pulse suddenly weakened and disappeared, her skin turned ashen gray, and her pupils dilated. Water was dashed on the girl's face, and brandy was poured into her mouth. An attempt was made to bleed her, but no blood could be obtained. Apparently, the girl was dead. This was the first reported cardiac arrest during an operation under anesthesia.[1]

Incidence

Many observers believe that there has been a definite increase in the number of cases of cardiac arrest and that the occurrence may be five times as great as it was 10 years ago. Hosler[2] says that statistics for occurrence are unreliable.

It was estimated that in the City Hospital of Cleveland, Ohio, in 1952 cardiac arrest occurred once in every 739 cases.[3] In Western Reserve Hospitals, in the same city in 1951, it was estimated that it occurred once in every 1,400 cases.

If cardiac arrest is increasing in frequency, it is of great importance to us as physicians and surgeons to know why, but the final answer cannot be ascertained until many more statistics are collected and analyzed. The scope of surgery has broadened markedly in recent years; included are operations such as those on the heart and lungs which not too many years ago were considered impossible. Today these are relatively commonplace procedures. More anesthetic agents and depressing drugs are in general use than formerly. Operations are being performed on patients in older age groups after pathologic changes have occurred in vital tissues, and more surgical procedures are being done on the very young. These facts necessarily alter statistics. In addition, it is possible that increased awareness of the occurrence of cardiac arrest may be responsible for the greatest number of cases reported.

Etiology

The causes of cardiac arrest are thought to be many, but certainly there are two major categories:

1. The patient's intrinsic disease.
2. The medical and surgical technic.

Of the two, the latter probably is the cause far more frequently than the former.

Hosler[3] feels that etiologic factors prior to operation are:

1. Insufficient atropine preoperatively
2. Multiplicity and overdosage of preanesthetic drugs
3. Excessive administration of digitalis, quinine, et cetera
4. Underlying cardiac disease
5. Decreased vital capacity
6. Poor cardiac filling
7. Anemia
8. Poor state of nutrition
9. Anxiety
10. Shock
11. Excessive speed of induction of anesthesia
12. Errors of judgment
13. Abnormally elevated body temperature

To these I believe should be added underoxygenation and a poorly trained anesthetist with inadequate equipment.

Anesthetic agents are considered by Beck[4] to be one of the most important factors. First, it is necessary for the anesthetist to employ an anesthetic with which he is familiar. Cardiac arrest seldom occurs when the patient is in the proper state of surgical anesthesia, but it is prone to occur in the extremes of anesthesia —too light or too deep. Of course, the effect of various anesthetics on the individual heart cannot be predicted. However, it is well known that patients suffering from heart disease or hypertension do better with ether alone or ether and nitrous oxide combined. Patients with very high blood pressure do not do well under spinal anesthesia. It is a fact that cyclopropane and ethyl chloride sensitize the heart to epinephrine. The margin of safety with cyclopropane and chloroform, except in the hands of the expert, is very narrow, and Pentothal sodium possesses certain characteristics that are disadvantageous.[5] It is a potent respiratory depressant and histotoxic agent. Good judgment and intelligence are necessary when the combination of curare and Pentothal is used. At least 50 per cent oxygen should be used with Pentothal. Curare results in increased bronchial secretions; cocaine requires intelligent application. Since procaine depresses the myocardium and conduction system, doses of more than 200 mg. should not be used.

Treatment

Prophylaxis is the most important phase in the treatment of cardiac arrest. Treatment becomes see-

*Presented at the Fifty-Ninth Annual Convention of The American Osteopathic Association, Los Angeles, California, July 19, 1955.

ondary, and general practitioners, anesthetists, and surgeons should be more concerned with prevention than with therapy. However, once the condition arises it is of the utmost importance that the treatment be immediate, adequate, and properly completed. There is far more to proper treatment of cardiac arrest than merely performing thoracotomy and squeezing the heart.

It is not the purpose of this brief discussion to evaluate or elaborate on the current therapy of cardiac arrest. However, I do feel that a discussion of this important emergency would be incomplete without a brief review of the proper steps in cardiac resuscitation. There are two distinct steps:

1. Re-establishment of the oxygen system, and
2. Restoration of the heart beat.

The fact that these are two distinct steps is important and is frequently overlooked. One should not be confused with the other. Re-establishment of the oxygen system is the emergency act, for without adequate oxygen restoration, the procedure is to no advantage. Those concerned with this emergency must learn to keep first things first. It is important to know the things to do and the things not to do in the critical moments during which a life is hanging in the balance. When cardiac arrest occurs, time-consuming measures must be avoided. This is a particular warning to physicians in the specialty groups, such as eye, ear, nose, and throat, dentists, orthopedic surgeons, and general abdominal surgeons. Being unfamiliar with thoracic surgery, they hesitate to carry out immediate and proper treatment; that is, opening the chest and massaging the heart. And while they procrastinate, the oxygen deficiency of the brain results in permanent damage.

Hosler[3] believes that any normal heart that has stopped beating can be made to beat again. This refers to the occasional patient whose apparently normal heart suddenly and unexpectedly stops beating during an anesthetic induction or an operation. In making this statement, he assumes that:

1. There is no inherent cardiac disease.
2. Arrest has occurred in the operating room.
3. All the correct and necessary steps have been carried out within the accepted time limitation.

In the past, there have been tragically few instances of successful and complete cardiac resuscitation. The major reasons for this are:

1. Failure to have a definite plan of treatment.
2. Not acting within the time limitation.
3. Severe inherent cardiac disease.

Lack of understanding of the real problem by the persons involved is the principal factor in the first reason for failure. The surgeon's inhibitions about opening the chest accounts for the second factor. He wastes valuable time trying to prove that the patient is dead. As was previously stated, re-establishment of the oxygen system is an emergency act, but in order to re-establish the oxygen system the anesthetist must first recognize the arrest, and he must be familiar with the procedure and also have the proper equipment to carry it out. The surgeon himself must be so constituted that in all the confusion which surrounds the emergency he can perform the proper steps within a period of from 3 to 5 minutes.

In briefly summarizing treatment, I shall divide it into things not to do and things to do, following Hosler's[3] admonitions for the most part:

Things Not to Do.—

1. Precious moments must not be wasted when cardiac arrest occurs. Time must not be taken to demonstrate that cardiac arrest has occurred. If there is absence of pulse, blood pressure, and respiration, the patient, for all purposes, is dead, and slight movement of the heart is of no consequence.
2. No attempt should be made to administer artificial respiration by compressing the thoracic cage.
3. The blood pressure cuff should not be moved from arm to arm.
4. Waiting for an electrocardiogram is not necessary as electrical impulses may be recorded even 4 to 5 minutes after the heart has stopped beating.
5. Epinephrine should not be injected through the chest wall into the heart.
6. The patient should not be given a blood transfusion, either intravenous or arterial.
7. The rectal sphincter should not be dilated.
8. The spine should not be manipulated.
9. An abdominal incision should not be made in order to attempt subdiaphragmatic massage.
10. Intramuscular or intravenous medication should not be administered.
11. Asepsis is not necessary.
12. The chest should not be shaved or draped.
13. The interspaces should not be counted before the incision is made. The important thing is to save time!

Miscellaneous considerations.—

As implied previously, the anesthetist must be alert. It is his responsibility to place a properly fitting tube into the trachea and inflate and deflate the lungs adequately by compressing the rubber bag filled with 100 per cent oxygen. Of all the oxygen taken into the circulation, 22 per cent is retained by the brain.

The treatment of cardiac arrest is not a procedure to be carried out in the doctor's office or in an inadequately equipped hospital. It is strictly an emergency operation to be performed in the operating room, or near the operating room, within 3 to 5 minutes after the heart beat has ceased, by trained personnel who know what to do and how to do it.

There are cases on record in which a surgeon and an institution have been sued for failure to carry out proper cardiac resuscitation measures when cardiac arrest has occurred in a hospital prepared to carry out the proper procedure. However, there is no justification for the surgeon's opening the chest to perform cardiac resuscitation if the proper equipment and personnel are not available. If the anesthetic is being administered in a doctor's office and cardiac arrest occurs, the doctor is not justified in picking up a knife and slashing open the chest wall to massage the heart.

It is questionable if thoracotomy and cardiac massage are even justifiable if the heart beat has stopped for more than 5 minutes. It is true that a heart which has stopped beating for as long as 15 minutes can be restored to normal rate and rhythm, but obviously there is no advantage to restoring heart action if brain damage is so extensive that the patient will either succumb to cerebral edema within the next 24 to 48 hours or be merely a living mass of useless protoplasm from that time on.

It is interesting to observe in the experimental laboratory dogs in which cardiac arrest has been induced. For example, a dog which is resuscitated within the 5-minute time limit will be normal and alert the next day. A second dog in which the cardiac arrest has been present for a period of 8 minutes may be unable

to stand owing to lack of muscular coordination; he may have a complete reversal of personality or he may die. Personally, I do not believe a family would wish to have a child, or any other member, resuscitated, if it meant living the remainder of his life with complete loss of cerebration.

Medicolegal aspects

In this consideration, it would be foolish not to mention or to consider the possibility of malpractice suits. Sometimes it is difficult to understand how such action could be instituted against an alert, well-trained surgeon who had unsuccessfully attempted resuscitation.

The charge of malpractice comprises two essential allegations:

1. That the physician fails properly to perform his duty, and
2. That definite injury to the patient results from that failure.

Reagan[5] says:

Any patient may bring a malpractice action against any physician who has attended him professionally. The bringing of such action does not, of course, even suggest that the claim has any merit. . . . No physician or surgeon may justifiably be charged with malpractice unless, in the service rendered to his patient, he fails to meet the requirements of good professional practice; unless, in the diagnosis or treatment of his patient, he omits to do something he should do or does something he should not do, measured against accepted standards of practice. And the standard of practice is always what the ordinary reputable practitioner in the community, or in similar communities, would or would not do in the care of similar cases.

What is believed to have been the first malpractice suit in this field occurred in February, 1952, in Cleveland.[3] A plaintiff charged the surgeon with negligence for not attempting to institute cardiac resuscitation. At the same time the hospital was also charged with negligence for failure to have a stand-by surgeon qualified to open the patient's chest and carry out this procedure. After hearing 2 days of charges, at the conclusion of the plaintiff's case the judge granted motions to arrest testimony and entered judgment for the defendant. This malpractice suit is not to be applauded, but it could be beneficial, for complacency was shaken as a result.

The resuscitative procedure is usually simple if one takes positive action. The only requirements are courage, speed, clear thinking, determination, perseverance, a few special instruments, and preparedness of the doctors involved.

Detroit Osteopathic Hospital Cases

I would like to review briefly the recognized cases of cardiac arrest at the Detroit Osteopathic Hospital covering a period of 4 years, from 1951 through 1954. During this period there were 15,210 major surgical procedures, 12,497 minor surgical procedures, and 16,555 deliveries. This is a total of 44,262 anesthetics administered. There were nine cases of recognized cardiac arrest recorded during this period. Since the percentage (1 case of cardiac arrest in every 4,918 operations) is unusually low in comparison with other centers, I feel certain that some cases went unrecognized.

It is to be remembered that with a large staff carrying a heavy schedule it is impossible to make all concerned equally cognizant of cardiac arrest and to standardize therapy. This may account for the small number of cases in relation to the large number of anesthetics and surgical and obstetric procedures carried out in this institution. It, however, does not lessen the responsibility of being prepared to carry out intelligent treatment.

Within the past year marked changes have occurred at our hospital. Cardiac arrest trays, together with the proper drugs for resuscitation, have been placed in the obstetric suite, in the orthopedic department, and in the general surgical suites. Anesthetists, surgical residents, and some of the surgical staff have availed themselves of the course in resuscitation being given by the Cleveland Area Heart Society at Western Reserve University. Regular drills have been carried out by some of our staff to prevent loss of time and to insure prompt treatment once the occasion arises.

Case Reports

Case 1. An underweight female, aged 8 years, who previously had been hospitalized for rheumatic fever was admitted for tonsillectomy and adenoidectomy. The patient was prepared for surgery. Premedication was Delvinal sodium, 1½ grains, Demerol 30 mg. and scopolamine 1/260 grain. Emesis occurred shortly after administration of Delvinal, so it was thought that only part of the dosage was absorbed. Tonsillectomy and adenoidectomy were performed under endotracheal ether anesthesia. The patient was returned to her room without having reacted after anesthesia. Shortly thereafter an intern was called to check the patient. Cyanosis and absence of pulse and respirations were noted. An endotracheal tube was put in place for administration of oxygen under positive pressure; the chest was opened and the heart massaged after a questionable time lapse of 5 to 15 minutes. (It should be noted that the time between cardiac arrest and resuscitation measures is not known for certain.) Epinephrine was injected directly into the left ventricle. Twice electrical shock was administered to the heart. The resuscitation attempt was carried out for about 30 minutes to no avail. Postmortem findings revealed a congenital large interarterial septal defect.

Error and Comment: This was a case of intrinsic cardiac disease. Preoperative cardiac evaluation was inadequate in view of the history of rheumatic fever. No atropine was given.

Case 2. A 58-year-old female was to undergo operation for adenocarcinoma of the sigmoid colon. Her preoperative condition was satisfactory. Premedication consisted of Delvinal sodium, 1½ grains; Pantopon, ⅓ grain; and scopolamine, 1/200 grain. The operation was performed with spinal block, Pentothal induction, cyclopropane, and oxygen. The patient's blood pressure was unstable from the onset of surgery. Unusual amounts of vasopressor drug were required. Massive hemorrhage due to friability of tissues occurred 1½ hours after the onset of anesthesia. The patient was intubated. Her color became poor, her pulse feeble, and her blood pressure unobtainable. Apparently cardiac arrest had occurred. Epinephrine was given intravenously; Levophed and Neosynephrine drip was started. Passive respirations were begun, transdiaphragmatic cardiac stimulation was instituted, and the blood pressure and pulse returned. The operation was completed and further supportive measures instituted. The pa-

tient was returned to her room in poor condition. Her recovery was slow, but she was able to return for the second-stage abdominoperineal resection 2 weeks later. This was performed without incident, and the patient was discharged 3 weeks following the second procedure in an improved condition.

Error and Comment: A multiplicity of anesthetic agents was used; no atropine was given. If the abdomen is open, transdiaphragmatic stimulation is justified for a very limited time only. If this fails, thoracotomy should be done immediately, provided no more than 3 to 5 minutes have elapsed since cardiac arrest occurred.

Case 3. This patient, a female, aged 75 years, was a poor surgical risk for open reduction of a fracture of the left femur. Premedication consisted of Demerol, 75 mg., and atropine, 1/300 grain. Spinal block anesthesia was used. Her leg was amputated under fluoroscopy. Following this and prior to the onset of surgery, cardiac arrest occurred. Vasoconstrictors and oxygen were given. No further measures were taken to attempt resuscitation.

Error and Comment: This was a case of error in judgment of procedure. Conservative management of fracture should have been considered.

Case 4. A female, 61 years of age, was to be operated on for umbilical hernia and large abdominal panniculus. She had diabetes and hypertensive heart disease. Electrocardiography showed some myocardial dysfunction. Premedication consisted of Delvinal, 3 grains; Pantopon, ⅓ grain; and scopolamine 1/200 grain. Spinal block anesthesia was used with Pentothal induction. An endotracheal tube was in place prior to surgery. Abdominal lipectomy and repair of ventral hernia were performed. Apparent cardiac arrest occurred following closure of the peritoneum. This was reopened, and the heart was stimulated through the diaphragm. Vasopressors, oxygen under positive pressure, and blood were administered. After a very short period of stimulation of the heart, normal action returned. Closure was completed, and the patient returned to her room in fair condition. Postoperative recovery was relatively uneventful, and the patient was discharged in an improved condition 3 weeks later. The reason for the unusually long stay was for control of the patient's diabetes.

Error and Comment: This was another case of intrinsic disease: diabetes, obesity, and hypertension. Sub-diaphragmatic "tickling" of the heart is permissible for a short period if the abdomen is open, but not for more than 1 to 2 minutes. If the abdomen is not open, time should not be wasted in attempting this approach, but immediate thoracotomy should be carried out. The above case illustrates the value of proper oxygenation of the patient by endotracheal intubation by the anesthetist.

Case 5. A male, aged 67 years, was to undergo operation for bronchogenic carcinoma. The patient was prepared for bronchoscopy. The premedication was Delvinal sodium, 1½ grains, Demerol 30 mg. and scopolamine, 1/200 grain. Spinal block anesthesia was used with Pentothal induction. Shortly after induction, cardiac arrest occurred. An endotracheal tube was immediately put into place. Ephedrine and epinephrine were administered intravenously, and epinephrine was injected directly into the cardiac muscle. The blood pressure and pulse returned. After the patient's condition was relatively stable, she was returned to her room. She remained comatose and died 4 days later.

Error and Comment: This was another case of intrinsic disease. It is doubtful whether a patient with cholelithiasis and cardiac disease should be subjected

Topical Pontocaine, 2 per cent, was used for anesthesia. Bronchoscopy and biopsy were performed and the bronchoscope removed. The patient was placed in the upright position, but within 5 minutes his respirations became labored and his color became poor. Cardiac arrest occurred. The patient was intubated and oxygen administered under positive pressure. His chest was opened and the heart was massaged for about 20 minutes before attempts at resuscitation were discontinued.

Error and Comment: Intrinsic disease? No atropine was given. (Time was not recorded.) This case demonstrates that cardiac arrest can occur in minor procedures, and that even though reasonably adequate procedures are carried out with proper oxygenation and thoracotomy, the outcome may be fatal.

Case 6. A 49-year-old woman with congenital atelectasis of the left lung was scheduled for bronchoscopy. Delvinal, 1½ grains, was administered about 1½ hours prior to surgery, and 3 grains more were administered 45 minutes prior to surgery. The patient was prepared for the procedure with 2 per cent Pontocaine, used as a spray and for direct injection, the total being from 3 to 5 cc. The patient appeared to be overmedicated at this time, and her pulse was checked. Cardiac arrest had apparently occurred. Intubation was immediately performed and the chest was opened immediately. Cardiac massage was carried on for about 2 minutes before normal activity was noted. The patient was observed for 10 minutes before closure of the chest. Oxygen administration under positive pressure was continued for 30 minutes, then extubation was performed. The patient was returned to bed in fair condition. She was treated medically for the chest condition for the next week and then discharged.

Error and Comment: Overmedication. Patient responded to prompt resuscitation measures.

Case 7. A female, aged 69 years, was operated on for possible empyema of the gallbladder. She was considered a poor risk for surgery because of auricular fibrillation, moist rales, and decompensation. The patient was digitalized and taken to surgery. Premedication consisted of Delvinal, 1½ grains; Demerol, 50 mg.; and atropine, 1/150 grain. The anesthetic consisted of nitrous oxide and oxygen, ether, and Anectine. Respirations and pulse ceased 1½ hours after administration of the anesthetic was started. Treatment consisted of administration of epinephrine intravenously and artificial respiration. The patient was pronounced dead 10 minutes after respirations and pulse had stopped.

Error and Comment: Poor judgment. Local anesthetic should have been used for simple drainage of the gallbladder. A totally inadequate resuscitation procedure was used, with no attempt at thoracotomy and cardiac massage. Intrinsic disease possibly was the dominant factor in arrest.

Case 8. A woman, aged 56 years, was to undergo operation for cholelithiasis. There was a history of previous cardiac disease. Electrocardiography showed marked left axis deviation and early atrioventricular block. An old tuberculous chest lesion was noted on the preoperative chest x-ray. The woman's weight was 175 pounds, height 5 feet, 6 inches, blood pressure 160/90 and pulse 62. A mitral systolic murmur was present. Premedication consisted of Nembutal, 3 grains, Pantopon, 1/6 grain, and scopolamine, 1/200 grain. Spinal block anesthesia was used with Pentothal induction.

to cholecystectomy unless the operation is absolutely necessary.

I deplore methods such as transthoracic injection of epinephrine used for resuscitation. This patient evidently suffered from marked hypoxia and cerebral edema as evidenced by her failure to regain consciousness and death within 4 days. The time element as a critical factor cannot be overemphasized.

Case 9. A 65-year-old man was scheduled for excision of a urinary fistula which developed following segmental resection of the bladder with radium insertion 4 weeks previously for carcinoma. Premedication consisted of Delvinal, 2 grains; Pantopon, 1/12 grain; and scopolamine, 1/400 grain. The patient was given Pentothal and cyclopropane anesthesia. Arrhythmia developed shortly after induction. Intravenous injection of procaine was started. Shortly thereafter absence of pulse was noted. The peritoneum was opened and the heart stimulated through the diaphragm for about 2 minutes before heart action and normal respirations returned. The incision was closed. Following medical consultation the diagnosis was supraventricular tachycardia due to cyclopropane intoxication and sensitivity; the prognosis was grave owing to decreased cardiac output and cerebral hypoxia. The patient was digitalized and supportive treatment was carried out. He remained in a critical and disoriented condition and died the next day.

Error and Comment: Local anesthesia would have been better because of the preoperative cardiac status. Laparotomy was done rather than thoracotomy. No atropine was given.

Case 10. This case occurred several years prior to the cases reported above. A young, multiparous woman was admitted in tumultuous labor, apparently in great pain. Open drop Vinethene was administered by the intern. Shortly after induction, the pulse stopped and sudden death occurred. The chest was not opened. The mechanism of death was attributed to ventricular fibrillation due to increased irritability of the myocardium from fear, pain, and anesthetic vapor.

Error and Comment: This death might have been prevented if sedation had been induced with an intravenous barbiturate before any type of anesthesia was given.

Summary

1. Cardiac arrest during anesthetic and surgical procedures is apparently increasing in frequency for reasons still undetermined.

2. Preparedness and the limitation of time are important factors.

3. Close cooperation between general practitioner, anesthetist, and surgeon is absolutely necessary.

4. This method should be utilized only by well-trained personnel and within an adequately equipped hospital.

5. The hospital and its personnel have definite medicolegal responsibilities in cases requiring cardiac resuscitation.

6. Every hospital, regardless of size, should have proper equipment and at least one staff member who is qualified to administer treatment.

12561 Third Ave.

References

1. Heckel, E., and Fell, E. H.: Cardiac arrest during surgical operations; causes, prevention and active management. S. Clin. North America 35:243-253, Feb. 1955.

2. Hosler, R. M.: Personal communication.

3. Hosler, R. M.: Manual of cardiac resuscitation. Charles C Thomas, Springfield, Ill., 1954.

4. Beck, C. S.: Treatment of cardiac arrest. Veterans Administration Technical Bulletin, TB 10-65, July 18, 1950.

5. Paulson, J. A.: Thiopental sodium and ether anesthesia. J. Am. M. A. 150:983-987, Nov. 8, 1952.

6. Regan, L. J.: Doctor and patient and law. Ed. 3. C. V. Mosby Co., St. Louis, 1956.

Problems of the CERVICAL SPINE*

ARNOLD GERBER, D.O., M.Sc.
Philadelphia, Pennsylvania

IN A PREVIOUS PAPER I discussed cervical pain with associated brachial neuritis or neuralgia. In this paper I shall augment that discussion by presenting more cases in the last two categories of the classification presented there. In addition some traumatic cases will be reviewed.

In the initial paper patients with cervical pain associated with radiation to an extremity were divided into three groups:

1. The first group is comprised of patients with muscle spasm or tension as the predominant factor, with no frank destructive process of the bone or joint structure. The muscle stress may be primary, caused by myositis, or secondary, caused by acute arthrodial reaction or osteopathic lesion of the cervical arthrodia. The patient has acute torticollis, with certain motions of the cervical spine causing distress. There is palpatory tenderness over the specific cervical arthrodial lesion, and the musculature is tender. Passive motion of the cervical spine induces the sensation of pull or strain. There is no reflex or sensory change. Percussion of the vault of the skull does not induce discomfort. This type of patient will not be discussed in this paper.

2. The second group is comprised of patients with actual organic change of the cervical vertebrae, due to a destructive process or productive disease, involving principally the bodies of the vertebrae, with secondary changes in the intervertebral disk spaces from obliteration due to collapse or variation from the overlying bone change. The objective and subjective findings will be mentioned along with those found in the third group.

*Presented at annual meeting of the American Osteopathic Academy of Orthopedists, Washington, D.C., October 31, 1955.

3. The third group is comprised of patients with involvement primarily of the cervical articulations, both the arthrodial and the intervertebral disk articulations; it includes patients with spondylosis, spondylarthrosis, and herniated disk.

The symptom-pictures in the last two groups overlap and can be described under the same heading. The degree of pain or positive findings may vary, but some characteristic signs and symptoms will be evident to the examiner.

Methods of diagnosis

The pain is cervical with some amount of brachial radiation. The head is usually held in a forward defensive position, showing loss of cervical lordosis. Active and passive motion of the cervical spine are restricted. Hyperextension of the head and neck induces pain. Rotation and sidebending induce some degree of pain. Percussion of the vault of the skull may induce pain. The Spurling test is positive. Compression of the head on the cervical spine is painful. Palpation of the cervical musculature elicits tenderness. If there is nerve root compression, hyperesthesia, and/or paresthesia in the upper extremity are evident to some degree. Reflex changes vary according to the degree of involvement. There may be muscle weakness and atrophy, as well as fasciculations, the distribution depending upon the nerve root affected. In categories 2 and 3, the important differentiating factor will be the results of the roentgen examination.

Three types of x-ray studies are applicable: conventional examination of the cervical spine, Pantopaque myelography, and laminagraphy. Usually the conventional roentgen study will be adequate if there are no compressive phenomena or root signs. X-rays will reveal gross bone disease, and ancillary means, such as laboratory tests, will aid in the final diagnosis. Sometimes the depth of penetration of the pathologic condition requires interpretation, or the degree of comminution of a fracture must be determined; laminagraphy gives a broader perspective to the radiologic interpretation. Opaque study is of inestimable value if compression phenomena are not due to visualized bone. Routine x-ray study in the conventional manner and Pantopaque myelography are the technics I employ most frequently in the study of cervical problems.

Management

When confronted with a particular case of cervical pain, my approach is as follows: The patient is sent to the hospital for study and treatment. With the exception of patients seen immediately after injury, the vast majority have been having osteopathic manipulative therapy for a period ranging from weeks to months. Upon hospitalization the patient is ordered to bed and a preliminary x-ray survey of the cervical spine and routine laboratory work are carried out. In addition, I usually order blood acid and alkaline phosphatase determinations in the male, and alkaline phosphatase determination in the female. Blood calcium and phosphorus determinations are also requested. In selected cases, when I feel that the preliminary cervical x-rays or some other aspect of the initial investigation warrants it, blood cholesterol and blood protein determinations are also ordered. Any other study is usually carried out because definite findings relate to the possibility of a specific diagnosis; for instance, findings of anemia, protein reversal, and osteoporosis make bone marrow studies necessary because of the possibility of multiple myeloma. A tuberculin test is ordered if the lung x-ray is questionable. A thorough oncologic investigation should be made for a primary site in the thyroid, breast, lung, kidney, gastrointestinal tract, or prostate when there is evidence of a lytic lesion of the cervical spine.

Treatment at the time of admission consists of complete bed rest in the supine position and traction of 7 to 10 pounds, with sandbags on either side of the head. Pain is relieved with adequate analgesia and a muscle relaxant; usually a curare-like drug of the depot type is prescribed. This may be augmented with Butazolidin, an anti-inflammatory drug. In my experience, the effect of the analgesic has been potentiated with Thorazine, given in 25-mg. doses three or four times daily. Soft tissue osteopathic manipulative treatment is utilized twice daily to help relieve the local muscle spasm, although this may be withheld in gross traumatic cases in which there is definite fracture.

Definitive treatment, based on the first x-rays and routine studies, may then be instituted. From the findings of the clinical examination, continued traction or manipulation under anesthesia may be indicated. Casting or bracing may also be considered the therapy of choice in the individual case. Manipulation of the cervical spine, for variants of the syndrome under discussion, has been taught in all our osteopathic colleges. Ewer[2] has written a very fine article on manipulation of the spinal segments.

If information is inadequate for the surgeon, laminagraphy may be carried out to determine the extent of bone involvement. This is not routine and is utilized only when in the opinion of the radiologist it is warranted.

Pantopaque myelography is considered whenever there is clinical evidence of a compressive phenomenon. If the pressure symptoms are marked and the duration relatively long, contrast studies should be carried out without delay. If the findings are controversial and the subjective complaint equivocal, traction is tried for at least 7 to 10 days, and re-evaluation is performed prior to actual Pantopaque myelography.

Case reports

Case 1. A 60-year-old female was admitted with numbness in the left hand and pain in the left arm. Onset had occurred 2 months prior to admission, with pain in the left side of the neck. The patient did not respond to osteopathic manipulative treatment and was given eight x-ray treatments. She had suffered for the past 10 years with intermittent discomfort on the left side of the neck. The patient had fallen down the cellar steps 10 years before and had injured her coccyx. Left mastectomy for carcinoma had been performed 2 years before admission.

The patient was a slender, white, elderly female. There was some degree of weakness and also paresthesia of the entire left hand, but on objective investigation there was sensory diminution only over the volar and dorsal aspects of the fourth and fifth digits and the hypothenar eminence. There was increased numbness of the left hand on elevation, but there was no radial pulse variation. There was tenderness in the left supraclavicular fossa but no mass formation, and tenderness and fullness in the left paravertebral cervical muscle area at the level of the fifth cervical vertebra. There was pain in the left arm and hand on extension and flexion of the head and active and passive limitation to movement of the head and neck. The Spurling test was positive on the right and left sides. There was percussion tenderness over the vault of the skull. A chest x-ray was negative. A complete blood count, blood sedimenta-

tion test, and laboratory examination of the cerebrospinal fluid were all within normal limits. The alkaline phosphatase content of the blood was slightly elevated. Pantopaque myelography revealed an irregularity in the column of fluoroscopy, and the film study showed a constant irregularity on both sides of the oil column at the levels of the fifth and sixth cervical vertebrae, possibly indicating changes in the subarachnoid space which might be caused by hypertrophic osteoarthritis or other degenerative changes affecting the cervical spine. The conclusion was that the myelographic findings were equivocal in relation to a cervical disk disorder.

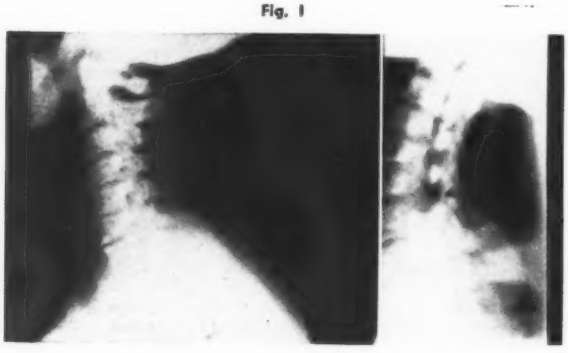
Treatment consisted of cervical traction and administration of Protamide. The patient was discharged as improved after 13 days. She was seen 1 month later and was symptom free. Slight pain could be induced on hyperextension of the head and on forceful Spurling test. All other previous objective findings were absent at this time.

This case is rather typical, but the complicating factor as to whether the condition was simple spondylosis and spondylarthrosis of the cervical spine with concomitant disk involvement or whether a superimposed metastatic lesion was creating a new syndrome which was being masked by the history. Because of her age the patient was treated conservatively and the outcome was successful.

Dr. James M. Eaton had a similar case except that at laminectomy for a probable herniated cervical disk a metastatic carcinoma was found to have created the symptom-complex. After a thorough study in which there was no positive evidence of cancer, it was concluded that the patient presented a typical picture necessitating surgical intervention for a herniated disk.

Case. 2. A 43-year-old female had complaints of pain in the left upper dorsal region with radiation into the left arm and the left infraclavicular region of the chest which had been present for 6 weeks and increased on coughing or sneezing. There was slight weakness in the left hand but no paresthesia or numbness. There had been no traumatic incident, but there had been episodes of very slight discomfort during the previous few years. The patient was a short obese female. There were no significant neurologic findings. She held her head slightly forward, but passive and active motion was unrestricted. Hyperextension and the Spurling test induced pain in the area described, but without extremity radiation. There was palpatory tenderness over the seventh cervical and first and second dorsal vertebrae. X-rays of the cervical spine indicated degenerative arthrosis without narrowing of the intervertebral disk spaces and without impingement on the intervertebral foramina (Fig. 1). Results of laboratory tests were essentially negative. Pantopaque myelography was incomplete because of inability to control the oil column owing to the physical contour of the patient's neck. A small amount of dye passed into the cranial vault, and there was difficulty in removing the remaining oil from the subarachnoid space. Treatment consisted of complete bed rest, Hydrocortone, and salicylates. Procaine brachial block was also used. The patient had progressive improvement, and 2 months after discharge from the hospital, both objective and subjective findings were completely negative.

Fig. 1



In this case absence of a true radicular syndrome was atypical. There is no question that the entire syndrome was due to cervical spondylosis and spondylarthrosis, but contrast study was necessary to prevent overlooking a compression lesion of the roots. This case also shows the difficulty in performing myelography in the presence of unusual physical characteristics.

Case 3. This patient, a 60-year-old man, complained of pain behind the upper portion of the left scapula. He described a sensation like weak electric shocks in the region. There was no change on coughing or sneezing. Numbness was present in the base of the first digit on the left hand. The symptoms had been present for 4 months, but a form of this distress had been present over the spine of the scapula for years. In 1914 the patient had had pain over the scapula, but he thought it was the result of carrying heavy loads. He had been hospitalized elsewhere, and he had been treated with cervical traction and, because of lack of response, had been advised to undergo cervical laminectomy (myelography had not been performed). On admission to the Metropolitan Hospital there was no restriction of motion of the cervical spine, no pain was induced on active or passive movement of the cervical spine, and there was no palpatory tenderness over the cervical segments and no referred tenderness from percussion of the skull. There was mild atrophy of the left biceps, but no reflex or sensory changes were noted. There was definite prominence of the left supraspinous area over the scapula with exquisite point tenderness. There was smooth symmetric enlargement of the prostate.

X-rays of the cervical spine revealed degenerative spondylosis with narrowing of the fifth cervical disk space and productive spur formation. The intervertebral foramina at the same level were narrowed. The scapula and left shoulder appeared normal.

A Pantopaque myelogram revealed interruption of the opaque oil at the level of the fifth cervical vertebra, which was probably caused by disk degeneration protrusion of the annulus. Other studies were irrelevant. The left supraspinatus was explored operatively. Chronic myofascitis was found, and the involved tissue was excised. Pathologic examination showed necrotic and degenerated muscle and fatty tissue. The patient improved, and 3 months postoperatively was completely free of all symptoms and all objective findings were negative.

In this case x-ray investigation indicated a lesion of the cervical spine but the clinical findings pointed elsewhere. In spite of a positive myelogram which pointed to an extradural defect, aggressive therapy was directed to another site, and this resulted in amelioration of all symptoms. This does not eliminate the fact that a cervical disorder still exists, but rather that it was not the cause of the syndrome disturbing the patient. I suspect that the patient will have symptoms at a later date resulting from the lesion of the fifth cervical vertebra, but I believe conservative management will be effective.

Case 4. A 39-year-old white male was admitted to the hospital with pain in the right scapula which had been present for 5 days and which radiated into the right arm. This was associated with numbness in the thumb and first two fingers of the right hand. No specific factor had initiated the onset, which had been sudden, awakening the patient one morning. He had had a similar episode of scapular pain 1 year before but without the radiation.

The patient was small in stature and held his head flexed to the right. There was no reflex change. There was slight sensory impairment over the volar aspect of the thumb, index, and middle fingers of the right hand, pain on extension, side-bending, and rotation of the head, and palpatory tenderness over the cervical spinous processes.

The patient was placed in preliminary traction. X-ray studies indicated disk degeneration at the sixth cervical level with encroachment upon the intervertebral foramina of the third and

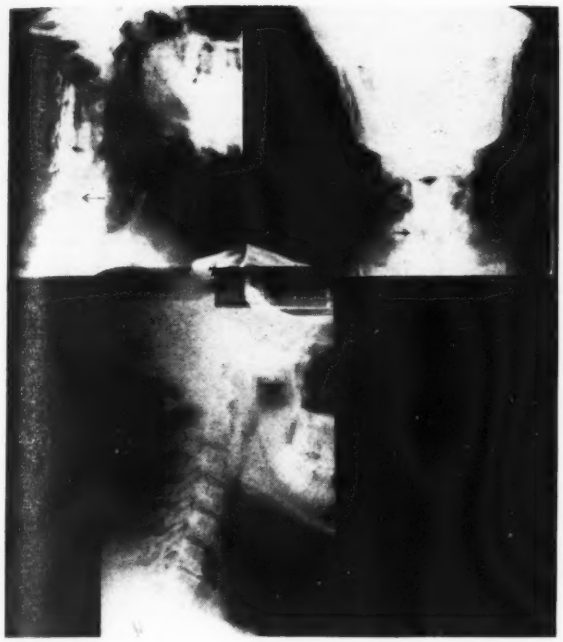


Fig. 2

sixth cervical vertebrae (Fig. 2, lower half). At Pantopaque myelography there was an impression on the oil column at the sixth cervical vertebra; it was most marked in the right lateral projection (Fig. 2, upper half). Cerebrospinal fluid contained 71 mg. of protein per 100 cc. When right hemilaminectomy was performed, the spinous processes were undisturbed. Frank herniation of the intervertebral disk with impingement on the root was seen at the level of the sixth cervical vertebra.

The patient had a relatively uneventful postoperative recovery, and the numbness in the right hand has slowly disappeared. The findings of all tests directed to the cervical spine have been negative. The patient is pain free, but he has neurotic complaints of insomnia and generalized fatigue. Occasional headaches are present which may be the result of oil droplets within the skull.

This case and the following one reveal the typical picture of herniated intervertebral disk at the cervical level with good surgical results.

Case 5. A 43-year-old female complained of pain in the neck radiating into the right shoulder, arm, and hand and into the head. The onset had occurred 6 weeks prior to admission and was related to a stiff neck. There had been no trauma. There were muscle weakness and paresthesia in the right hand. The pain was intensified when she was erect or lying flat.

The head was maintained in flexion with sidebending to the right. All motions of the cervical spine were painful and restricted. There was a positive right Spurling test with pain on sidebending to the right. There was palpatory tenderness over the spinous processes of the fourth to seventh cervical vertebrae and spasm of the cervical musculature. There was no reflex change. The right hand grip was weak, and there was sensory diminution over the ulnar aspect of the right forearm.

The patient was treated with 7 pounds of traction for 10 days without improvement. X-rays indicated a loss of cervical lordosis but no osseous disease. Pantopaque myelography indicated a posterolateral protrusion, probably due to the disk of the fifth cervical vertebra. Cerebrospinal fluid findings were normal. Hemilaminectomy of the fifth and sixth cervical vertebrae was performed under endotracheal anesthesia, and the herniated fifth cervical intervertebral disk was removed. There was frank herniation, with material free in the canal and covered with a very thin membrane. There was also compression of the nerve root with multiple adhesions. The disk was removed by simply teasing the material out with forceps. The patient's recovery was uneventful. At the time of the last examination the weakness was limited to the thumb with slight numbness, and there was no pain.

In the third case in which a pathologic cervical disk was treated surgically, the operative approach was different.

Case 6. A 53-year-old male was admitted to the hospital with chief complaints of pain in the base of the neck, radiation into the right arm, and numbness in the index, middle, and ring finger of the right hand. He had suffered two injuries to the neck some years earlier. Treatment over the years had been either traction or diathermy.

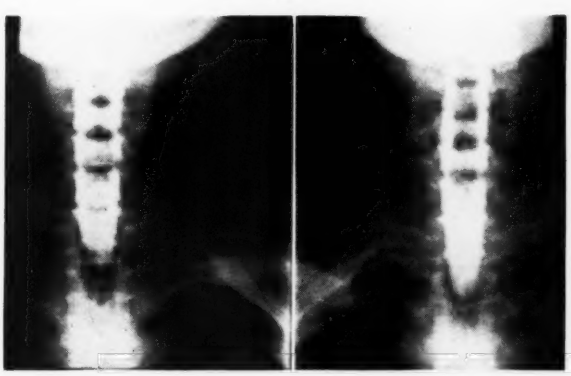
The patient's head was maintained in flexion. Extension, sidebending, and rotation to the right were all painful. There were no significant neurologic findings. Percussion over the vault of the skull induced the pain of the chief complaints. Findings of all other tests were essentially negative. X-rays indicated spondylitic changes of the cervical spine with narrowing of the sixth cervical intervertebral disk space. Pantopaque myelography showed an extradural defect on the right of the sixth intervertebral disk space (Fig. 3).

Cervical laminectomy was carried out. There was no frank herniation and osteoporosis with an osteophytic overgrowth at the sixth cervical vertebra was found. There was marked engorgement of the nerve root at that level and multiple adhesion formation about the root. The sixth cervical intervertebral foramen was markedly narrowed, and the peridural fat and ligamentum flavum seemed thicker than normal. A complete unroofing was performed. The patient had an excellent recovery from his symptoms, but his convalescence was complicated by dehiscence of the wound; this was closed by secondary repair. The patient was seen a year postoperatively and his recovery was excellent; he was completely pain free.

This case report is presented because complete laminectomy rather than hemilaminectomy was performed. The spinal canal was entirely unroofed and no attempt was made to remove the outgrowth, although I routinely remove retropulsions in the lumbar spine. I learned through experience at one of my early cervical laminectomies the difficulties which may arise from removal of the outgrowth. At that operation I attempted to remove an old osteocartilaginous outgrowth due to a pathologic disk but not to frank herniation, and the postoperative course was most difficult. Since then I remove only those disks which are truly herniated and free in the canal; in other cases I simply unroof the canal and attempt to relieve the pressure.

On the basis of sixty-five cases of cervicobrachial neuritis which were reviewed by Houlding,[3] it is his opinion that the symptoms are the result of disk protrusion due to relaxation of the posterior common ligament. His treatment consisted of manipulation under

Fig. 3



anesthesia, followed by traction. All but three of his patients were free of symptoms subsequent to therapy. These three patients were operated on. His technic differs in that he places a bone graft between the spinous processes over the involved intervertebral disk and attempts to separate the space posteriorly. This is reinforced by two larger grafts held together with a screw.

The effects of trauma on cervical spondylosis or spondylarthrosis are well illustrated in the following patient.

Case 7. A 51-year-old male was admitted with severe pain in the neck and down the left arm and with his head and neck markedly flexed and side-bent to the right. He had been in an automobile accident 5 days prior to admission and had suffered a whiplash type of trauma to the neck. There had been no immediate pain, but a few days later pain and numbness occurred along the inner arm and hand. He had never had any of the symptoms prior to this time.

Any motion was excruciating, and there was practically no movement of the neck either actively or passively. Percussion of the vault of the skull resulted in extreme pain. Percussion tenderness also occurred over the spinous process of the sixth cervical vertebra. There was fair strength in the left hand and questionable sensory aberration over the volar aspect of the left forearm and left hand. There was questionable absence of the left biceps reflex. No muscle atrophy was apparent.

The first impression was that of an acute herniated intervertebral disk. X-rays indicated degenerative spondylotic and spondylarthrotic changes of the cervical spine and loss of cervical lordosis (Fig. 4). There were forward shifting of the second cervical body on the third due to spondylarthrosis, narrowing of the fifth cervical intervertebral disk space, and marked spondylosis. There was mild encroachment of the foramen between the fifth and sixth cervical vertebrae due to productive osseous changes from the spondylotic process.

The patient was treated with traction, Thorazine, Tubadil, and Demerol and was entirely asymptomatic in 3 days. Three days after discharge from the hospital, he was entirely pain free, motion of the neck was unrestricted, and there were no reflex changes and no palpatory tenderness. However, there was still slight weakness in the left hand and numbness in the left index finger. He did not return until 3 months after discharge when he became frightened because of loss of sensation in the index and middle fingers of the left hand and numbness in the left arm on sidebending to the left. There was apparent atrophy of the left biceps.

The question in this case is whether true herniation had occurred or whether the trauma was sufficient to induce a marked inflammatory state on an already pathologic condition with subsequent permanent damage to the nerve roots. The original x-rays demonstrated that the intervertebral foramina were markedly narrowed owing to the pre-existing spondylosis and spondylarthrosis. However, no definite answer can be given since no contrast examination was made, and surgical exploration was not performed. At the last visit the patient was advised that hospitalization was necessary and Pantopaque myelography indicated.

Cervical trauma superimposed on underlying spinal arthrosis has a marked complicating effect on the problem. Platt[4] has cited evidence that paraplegia may result in such cases with very few signs of cervical displacement.

Cases 8 and 9 involve direct trauma to the cervical spine with fracture. Both are unique; in the first a severely injured elderly female responded with no apparent spinal cord effects, and in the second, a boy with extensive injury to the bony spine was also free of spinal cord findings.

Case 8. A 77-year-old female was admitted to the hospital within an hour after a fall down a flight of steps. The patient complained bitterly of suboccipital pain and pain in the skull. There was definite restriction to motion of the head and neck, both actively and passively. There were no positive neurologic findings. The patient also complained of a sore throat but there were no findings on direct pharyngeal examination. There was palpatory tenderness over the cervical spine and mild swelling over the right temporofrontal region and the left parietal zone. There were no other musculoskeletal findings. Moist rales were present in the base of the lungs bilaterally. Because of a history of hypertension she was also seen by an internist.

The patient was thought to have cervical contusion with spasm. She was treated with complete bedrest and sandbags on both sides of the head until x-rays could be made. The original study showed a possible subluxation of the second and third cervical vertebrae. The clinical picture remained unchanged. A recheck x-ray was made which revealed an odontoid process fracture with posterior displacement (Figs. 5 and 6).

Cervical traction of 5 pounds was initiated. The patient tolerated her traction well after the first few days. About 2½ weeks after admission, she appeared to have a cerebrovascular accident with a number of convulsions and recurrent comatose states. It was thought that she might have suffered a coronary incident, but this could not be confirmed by electrocardiography. She recovered completely from the complicating episode, and ambulation was permitted in a very rigid cervical brace. This was about 1 month after admission to the hospital. She was discharged from the hospital in good condition, wearing the brace. At examination 8 weeks after the accident there was mild pain over the right side of the neck and the right shoulder.

Fig. 4

Fig. 5

Fig. 6

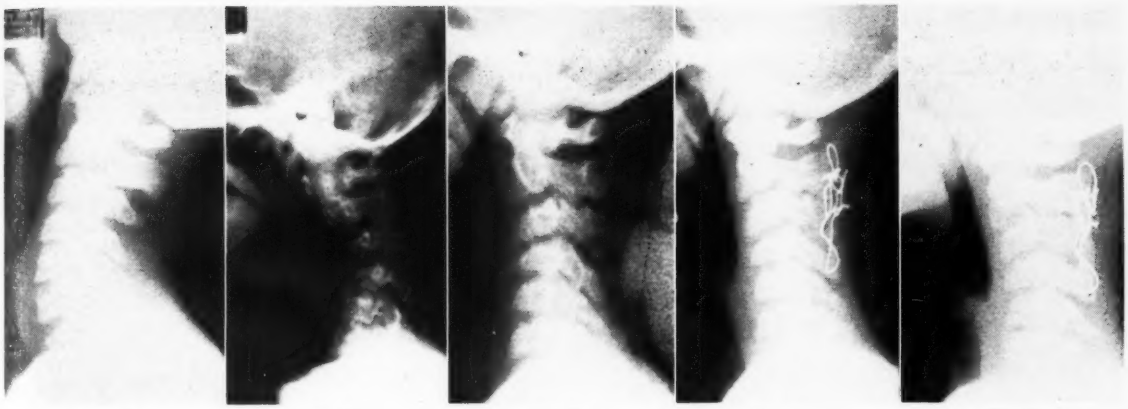


Fig. 7 Fig. 8 Fig. 9 Fig. 10 Fig. 11

but the patient held her head well. All reflexes were equal and active, and there were no pathologic reflexes. Motion of the head and neck was still restricted, but there was no palpatory tenderness. The patient walked without difficulty, although she continued to use the brace.

Cases 8 and 9 demonstrate the cardinal signs of trauma to the cervical spine, namely, spasm and loss of cervical lordosis, which create a restriction to motion of the head and neck, reaching the degree of severe torticollis. There is localized palpatory tenderness and percussion tenderness over the cervical spine. The lack of positive neurologic findings in the patient in case 8 confirms the frequent observation that if the odontoid process is fractured, with either posterior or anterior displacement, there is no injury to the spinal cord, whereas if the odontoid process remains intact and the transverse ligament ruptures, there is cord damage.[4]

Case 9. A 14-year-old boy was admitted to the hospital a day after a diving accident. The patient had dived into 2 feet of water and struck his head on the bottom. He complained of a stiff and sore neck. He held his head and neck rigidly and turned his head as part of the trunk when he attempted to look to either side. There was loss of cervical lordosis, and flexion and extension of the head and neck induced pain. A questionable Babinski reflex and diminished patellar reflex on the right were noted. The patient had had poliomyelitis at 1 year of age, and a corrective operation had been performed on the first toe of the right foot at 12 years of age. There was no percussion tenderness over the vault of the skull and no palpatory tenderness over the cervical spine.

X-rays revealed evidence of a slight compression type of mechanism involving the anterosuperior margin of the body of the third cervical vertebra (Fig. 7). With the head in forward flexion, altered vertebral mechanics were noted in the first three cervical segments, together with slight anterior subluxation of the third on the fourth cervical vertebrae which was corrected when the head was somewhat extended. Treatment consisted of continuous traction of 7 pounds for 3 weeks, and the patient was discharged wearing a cervical brace with his head in hyperextension. He was checked in the office every 7 to 10 days, and there were no signs of any complications. There was no pain, and motions of the head and neck were completely unimpaired when tested in the office. He claimed to have worn the brace at all times. Twelve weeks after discharge from the hospital the patient was found to have a posterior prominence of the cervical spine, but he was still asymptomatic. At this time the Babinski reflex was thought to be positive and the left patellar reflex was hyperactive. X-ray indicated complete subluxation of the third cervical vertebra on the fourth and partial subluxation of the second on the third (Fig. 8).

The patient was rehospitalized and placed in 10 to 15 pounds of continuous cervical traction. Laminagraphy was ordered to help determine the degree of unrecognized injury, but no additional information was obtained. A recheck x-ray after a period of traction indicated partial reduction of the subluxation of the third cervical vertebra on the fourth and almost complete reduction of the second on the third (Fig. 9). An exploratory operation was done under local anesthesia with Pentothal sodium analgesia. The spinous processes of the second and third cervical vertebrae were found to be involved in a large mass of callus. The ligaments between the first and second cervical vertebrae were completely ruptured, as were the ligamentum nuchae and ligamenta flava from the second to fourth cervical vertebrae. The second and third cervical vertebrae moved as a unit caudalward over the fourth cervical and cephalward on the first cervical. The spinous processes of the second and third cervical vertebrae were fractured and found as small fragments in the mass of callus, and the laminae of these vertebrae were fractured and contained within the callus. Internal fixation was done with No. 18 wire between the bases of the spinous processes of the first four cervical vertebrae. The interlaminar spaces were filled with bone chips from the iliac crest. The incision was closed, and the patient returned to his room in traction (Fig. 10). Ten days postoperatively the patient was placed in a head, neck, and torso cast of plaster of paris. An x-ray with the patient in the cast was made prior to discharge and indicated maintenance of the corrected position of the cervical spine. He was discharged from the hospital 3 weeks after the operation, and was ordered to remain in bed.

The cast was removed after 12 weeks, and x-ray revealed maintenance of position. Ambulation was then permitted with the patient wearing a cervical brace. He has been checked at frequent intervals and has remained completely asymptomatic. Complete immobilization appears to have occurred in the upper aspect of the cervical spine (Fig. 11). The left patellar reflex is still hyperactive and a Babinski reflex cannot be obtained. There is a tremor in the left lower extremity.

This patient had very little objective or subjective symptomatology at the time of the initial examination, and the roentgen study also indicated minimal osseous damage. The seriousness of the situation was not appreciated, and the patient and his family minimized the injury to a far greater extent and had to be convinced of the necessity for treatment.

Albee, Powers, and McDowell,[5] in discussing fractures and fracture-dislocations of the cervical spine, have stated: "Although plaster remains the most satisfactory method of immobilization after reduction, recurrence of the deformity may develop soon after its removal, or may gradually increase. The deformity may recur or increase even while support is being worn." There was adequate evidence of deformity developing in this patient. There was also some question of neurologic involvement, which was never confirmed, after the onset of the deformity. Bohler[6] has said that if

there is fracture of the anterior and posterior arches of the spinal ring, there is less likelihood of cord damage than if only one portion of the ring is broken. At operation to correct the deformity, adequate evidence of multiple fractures of the posterior arch was found, and previously there had been x-ray evidence of damage to the anterior ring with compression of the body of the fourth cervical vertebra and subluxation of the second cervical vertebra on the third and the third on the fourth. Probably the varied osseous involvement of the spinal ring saved this patient from paraplegia or death.

Spinal fusion is indicated following trauma to the cervical spine:[7]

1. When more than one of the bony structures are severely injured.
2. In multiple fractures—as a rule.
3. In fractures of the odontoid, even though there is no demonstrable vertebral injury.
4. When deformities recur following reductions, in spite of careful immobilization.
5. For high cervical lesions with paralysis of neck muscles, due to cell involvement of the anterior horn of the spinal cord.

Discussion

I shall now briefly discuss general injuries of the cervical spine The majority of injuries to the cervical spine are the result of hyperflexion of the column. Cases 8 and 9 were hyperflexion injuries due to direct force on the skull which brougnt the spine forward. The typical whiplash injury usually is caused by abrupt cessation of body momentum with continued forward motion of the head, hyperflexion thus resulting. The normal range of flexion is exceeded, and there is then extensor recoil. The degree of whiplash is proportional to the speed at the moment of impact. Because of the recoil action, the massive displacement or disruptive picture is masked by resumption of so-called normal alignment. The injury may range from simple sprain to complete dislocation and fracture of the cervical spine with transection of the spinal cord.[8]

Platt[4] classifies injuries of the cervical spine in the following manner:

Fractures of a spinous process
  Associated with a neck injury
  Shoveler's stress-fracture of a spinous process
Transverse process fractures
Fractures and displacements peculiar to the upper cervical spine
  Fracture of the atlas
  Displacement of the atlas on the axis
  Fracture of the odontoid process
  Fracture-dislocations of the axis on the third cervical vertebra
Fractures and fracture-dislocations of the lower cervical spine from the third to seventh vertebrae
  Injuries due to forced flexion: compression fractures, dislocations and fracture-dislocations without fixed displacement, and dislocations and fracture-dislocations fixed by locking of facets
  Injuries due to forced extension
  Injuries to disk without fracture or dislocation
Injuries to pathologic spines
  Spondylitis osteoarthritica
  Ankylosing spondylitis
Sprains.

Since the majority of injuries to the cervical spine are the result of flexion, treatment usually consists of reversing the mechanism and obtaining extension. Usually traction with a head halter is indicated, and this may later be supplemented with actual skeletal traction with skull tongs. Mild constant traction may be indicated, or it may be necessary to utilize strong corrective forces to bring about dislodgment of displaced articular facets with a full dislocation. Fixation may be obtained with a full head, neck, and torso plaster of paris cast in major injuries or with some brace device if the injury is minor Sometimes the degree of injury is not satisfactorily evaluated, the immobilizing device is inadequate, and late complications develop. Laminectomy or open reduction is indicated for compressive signs, or internal fixation and fusion are necessary if other forms of maintenance fail.

Summary

The problem of cervical pain, with and without antecedent trauma, has been discussed, along with case presentations of patients with the syndrome. A brief summary of injuries to the cervical spine has been presented. Those patients with cervical lesions who fall into the first category of my classification and who respond so favorably to osteopathic manipulative therapy have not been included in order to allow discussion of those cases with actual organic changes in the cervical osseous structures.

5040 Chestnut St.

References

1. Gerber, A.: Cervical pain with associated brachial neuritis or neuralgia. J. Am. Osteop. A. 51:225-231, Dec. 1951.
2. Ewer, E. G.: Manipulation of spine. J. Bone & Joint Surg. 35A: 347-354, April 1953.
3. Houlding, R. N.: Cervicobrachial neuritis. J. Bone & Joint Surg. 35B:325, May 1953.
4. Platt, H., ed.: Modern trends in orthopaedics. Paul B. Hoeber. New York, 1952.
5. Albee, F. H., Powers, E. J., and McDowell, H. C.: Surgery of spinal column. F. A. Davis Co., Philadelphia, 1945, p. 103.
6. Bohler, L.: Lectures on spinal fractures. American College of Surgeons, Fracture Course, 1955.
7. Albee, F. H., Powers, E. J., and McDowell, H. C.: *Op. cit.*, ref. 5, p. 104.
8. Key, J. A., and Conwell, H. E.: Management of fractures, dislocations and sprains. Ed. 6. C. V. Mosby Co., St. Louis, 1956.

Chronic illness

The challenge of chronic illness is seen in the lives of all those who are adversely affected physically, socially, and economically, and particularly in the lives of the estimated 2 million adults who, though now idle, could become employable and tax paying if provision were made for their rehabilitation. More than 90 percent of these persons could be brought to complete economic self-sufficiency if adequate facilities for rehabilitation were available to them.—*Public Health Reports*, July 1956.

The
JOURNAL
of the AMERICAN
OSTEOPATHIC ASSOCIATION

Editor RAYMOND P. KEESECKER, D.O.
Associate Editor KATHERINE BECKER

This periodical is the official scientific publication of the
AMERICAN OSTEOPATHIC ASSOCIATION

President ROBERT D. McCULLOUGH, D.O.
Executive Secretary TRUE B. EVELETH, D.O.
Business Manager WALTER A. SUBERG
Director of Advertising CLAYTON N. CLARK, D.O.
Treasurer ROSE MARY MOSER

Editorials

A National Health Survey

BEFORE THIS ISSUE of THE JOURNAL is in our readers' hands, the results of our national election will have been determined. Already predetermined is the commitment of both of our major political parties to what in effect is a national health program—whether or not it is so named is of little moment. In fact, the rivalry manifested in the closing weeks of the campaign over all aspects of how to minister to and improve the nation's health lifts the whole issue above partisan level. This interest in health plans by political parties cannot be categorized as mere pre-election promises. The commitments have been too strongly made by the leaders of both parties to be called off lightly, and the people of America are too determined that the blessings which advances in medical science make possible shall be made available to them and to their children.

The new administration (regardless of its political designation) has already been committed to institute and conduct a new National Health Survey Program, authorized as it was by passage of Public Law 652, approved by the President on July 3, 1956. The Survey will be a statistical study of the amount and distribution of illness in the United States—"illness covering all disease, injury, impairment, and resulting disability." Accompanying this massing of statistics will be figures on the amount of medical care utilized in connection with illness.

It has been 21 years since the last major survey was done on diseases, injuries, and impairment in the general population of the nation—that was the National Health Survey of 1935-36. During this tremendous undertaking 737,000 urban households were visited by interviewers who found, among other facts, which persons had experienced disabling illness of 7 or more days in the year prior to the interview and were believed to have specified chronic diseases or impairments at the time of the interview. Both before and after the 1935-36 survey, a number of smaller studies were done, including those of a community type. Although the data from many of these surveys is obsolescent, they will afford background for continuity, the better to interpret the results of this latest study. Past surveys also furnish information on the varying methodologies of such studies, their strengths and weaknesses, and the refinements needed in technics. Proper uses of the past in any field of study lead to better understanding of the present and make possible more intelligent planning for the future.

In this connection mention should be made of the report[1] of the President's Commission on the Health Needs of the Nation, made available to the public on December 18, 1952, a yearlong study by a broadly representative group resulting in a five-volume report which 4 years later remains an authentic document. Any physician moved by a sense of social responsibility as a doctor should get an over-all picture of this study, if only superficially; the report should certainly be in the library of every teaching hospital. In the closing sentence of his letter of transmittal to the President, the chairman of the Commission, Paul B. Magnuson, M.D., spoke a word applicable to all continuing studies, of which the projected National Health Survey will be the latest:

> In all humility, we think this report lays the groundwork for men of good will to unite in a common effort to improve the people's health, the background of our democratic strength in a free world.

These two studies, the one made and the other to be made, should perfectly supplement each other, the better to develop a national health program based on the cooperative action of federal, state, and local governments. An administration that takes no account of continuity of effort made for the common welfare does so at its own peril, and maybe that of the nation.

Planning for the National Health Survey Program is still underway, and the details are not yet complete for public release. The Survey Program is under the aegis of the Department of Health, Education, and Welfare; the responsibility for its organization rests

1. Building America's Health: Vols. I-V. A Report to the President by the President's Commission on the Health Needs of the Nation, U.S. Government Printing Office, Washington, D.C., 1952.

with the Division of Public Health Methods, assisted by the Bureau of the Census, advisory committees, and special consultants.

Public Law 652, under which the National Health Survey is implemented, received bipartisan support. Actual organization of the entire Program, together with decisions now being made regarding its various parts, is located within the office of the Surgeon General, Public Health Service.

It is becoming more and more evident that the pattern of medical practice in America is changing with tremendous rapidity. The maintenance of a people's health has become one of the first charges upon government. The doctor of tomorrow will occupy a more pivotal position than in any previous society. He will become increasingly a public servant. Certainly, he will continue to minister to the individual, but he will see in the individual, as in microcosm, the conflicts, contradictions, and problems that best the entire human family. He will be no less the healer, but more, for he will become scientist, social worker, and educator.

Such a project as the National Health Survey has a significance far beyond the facts and figures it will reveal; it is evidence of social forces at work reaching into and reshaping the practice of medicine. The wise physician is he who himself is aware of the probable shape of things to come.

The Tasker Letter

UNDER THE TITLE "California Historian Takes Stand," the November 1956 FORUM OF OSTEOPATHY publishes a letter by Dr. Dain Tasker of California. Its unusual length arrests attention, its subject matter more, because it is controversial, its author being opposed to the convictions and practices of an organized body within the profession known as the Osteopathic Cranial Association. The letter, however, involves much more than an airing of differences of opinion, which in itself would not justify publishing a communication of such length. Actually, the Tasker letter has a semi-official status. The point of view which Dr. Tasker sets forth in the letter has already been adopted as the official opinion of the California Osteopathic Association, by far the profession's largest divisional society.

The September 1956 FORUM carried a letter over the signature of Mr. Thomas C. Schumacher, executive secretary of the California Association, advising that it had been recommended and unanimously concurred in by the California Association's House of Delegates that the 1956 report of its historian, Dain L. Tasker, D.O., be mailed to the President of the American Osteopathic Association and to the president of the American Association of Osteopathic Colleges, with a request that copies be made available to each member of the Board of Trustees of the American Osteopathic Association and to the presidents of the six osteopathic colleges. The Tasker letter in the current issue of THE FORUM is, in effect, a resume of the California historian's 1956 report.

The body of which Dr. Tasker is critical is not made up of doctors meeting incidentally and occasionally, but is an affiliate of the Academy of Applied Osteopathy, a group of more than 1,200 osteopathic physicians. The Academy, in turn, is an official affiliate of the American Osteopathic Association, having had its beginnings in 1937 and having become a corporate body in 1944.

The records reveal that in 1943 the teachings of William Garner Sutherland, D.O. (A.S.O., '00), first came officially to the attention of the officers of the Academy of Applied Osteopathy. During the A.O.A. Convention in July 1946, in New York City, a meeting was held by osteopathic physicians who were interested in utilizing what was then termed "cranial principles and technics." The group chose the name Osteopathic Cranial Association, and petitioned the Academy of Applied Osteopathy for affiliation on the basis that the Academy had "fostered the growth and acceptance of cranial osteopathy throughout the profession."[1] Affiliation was granted by the Academy in 1946. In July 1947, the Osteopathic Cranial Association was formally organized, and its constitution and bylaws were approved by the Academy. The new organization reported a membership of 101 at that time.

The November 1955 Directory of the Academy of Applied Osteopathy lists 344 of its members as belonging to the Cranial Association. O.C.A. has its own officers, governing body, and committees and holds an annual convention and clinical conferences, separate and apart from the organization it claims as its parent body, the Academy. O.C.A. publishes a bimonthly *O.C.A. News Letter,* its September 1956 issue being Volume 10, number 1, and an annual *Journal* of which the 1954 issue was the fourth. The Osteopathic Cranial Association's constitution and bylaws provide that applicants for membership must be members of the Academy of Applied Osteopathy; that they shall have successfully completed an approved course in cranial osteopathy, of which O.C.A. shall be the approving body; and that all applications for membership must be approved by the O.C.A. executive board. Members shall be dropped for nonpayment of dues one year past, or for cause, upon vote of the executive board. Aside from a prerequisite membership in the Academy of Applied Osteopathy, the Osteopathic Cranial Association's relationship to its parent body, the Academy, appears a tenuous one.

In 1953, a foundation was incorporated in Colorado under the name of the Sutherland Cranial Teaching Foundation. The late Dr. Sutherland is credited with its evolution and was its first president. Its executive vice president was (and is) Harold I. Magoun, D.O., Denver, well-known doctor of osteopathy and author of "Osteopathy in the Cranial Field" (1951). On July 22, 1956, the Sutherland Cranial Foundation and the Osteopathic Cranial Association were merged by an amendment to the constitution of O.C.A., which provides that the S.C.F. be "the teaching unit of the

1. New Letter. Osteopathic Cranial Association, vol. 5, May 15, 1952.

Osteopathic Cranial Association." The Cranial Foundation, therefore, is now under the aegis of the Cranial Association.[2]

Several years ago a group was formed to conduct teaching conferences for the purpose of studying and investigating the application of specific osteopathic manipulative technics to the malleable cranium of children with cerebral palsy. The group has had several name changes and is now known as the Philadelphia Cranial Alumni Association; its address is that of its secretary-treasurer, Mary E. Williams, D.O., 3630 North High Street, Columbus 14, Ohio. This association reports less than fifty members in its 1955 listing. The records do not indicate that the group is affiliated with the Osteopathic Cranial Association or the Academy of Applied Osteopathy and it appears, therefore, to bear no relation to organized osteopathy, although the names of some twenty P.C.A.A. members do appear on the O.C.A. roster.

There are several questions which the Tasker letter may raise among members of the American Osteopathic Association, who generally seem to have little interest in or acquaintance with the theories and practices of "cranial osteopathy," and who know nothing about the status of the Cranial Association in its relationship to A.O.A. However, the professional and organizational position of "cranial osteopathy" should be clearly shown in relation to at least three areas of the osteopathic movement: First, the professional position of the individual osteopathic physician who practices "osteopathy in the cranial field" as determined by the Cranial Osteopathic Association; second, the organizational relationship of the Osteopathic Cranial Association to the American Osteopathic Association, involving the question of whether or not there ever has been any official sanction of "cranial osteopathy" by the A.O.A.; and, third, the editorial policy governing the position of official A.O.A. publications in relation to "cranial osteopathy."

First, the responsibility for the rational and ethical practice of osteopathy rests directly upon each osteopathic physician. No physician has a greater challenge than to guarantee to his patients a rational therapeutics. The physician, to a remarkable degree, is a free moral agent. The American Osteopathic Association, therefore, does not seek to limit the freedom of any doctor, his freedom to practice osteopathy as his best judgment dictates. The Association's position is a historic one, set forth over the years by its House of Delegates and its Board of Trustees. It has sanctioned, approved, and recognized but one concept—the osteopathic concept. The A.O.A. has never commended or adopted any particular method of treatment.

The second point involves not the individual doctor, but his national organization. A careful study of the A.O.A. Manual of Procedure, now a volume of more than 300 pages (first edition, March 1933; latest revision, April 1955) with more than a thousand topics indexed, reveals no reference to "cranial osteopathy," "cranial concept," or to any organized body directly or indirectly concerned with the subject of "osteopathy in the cranial field." Without reservation, therefore, it can be stated that the American Osteopathic Association has sanctioned no entity termed "cranial osteopathy," no special concept termed "the cranial concept," and no special form of treatment known as "cranial manipulation." Where there has been informal discussion of this matter, within official meetings, it has been only to emphasize that there is no particular and specialized method of structural treatment separate and distinct from osteopathic manipulative therapy.

The Tasker letter, however, sets forth a premise which can neither be validated nor confuted in these columns; namely, that the Osteopathic Cranial Association by its method of promulgation of the theories and practices of the late Dr. Sutherland advances an entity separate and apart from osteopathy, and one which cannot be substantiated by known scientific methods. Dr. Tasker, in his report to the California Osteopathic Association, considers that continued sponsorship of the Osteopathic Cranial Association by the Academy of Applied Osteopathy is, for all practical purposes, recognition of the entity of "cranial osteopathy" by the American Osteopathic Association. He draws the conclusion from the fact that the Academy is an official affiliate of the A.O.A., and the Cranial Association is a branch or affiliate of the Academy. This charge is a matter for investigation by the proper body or bodies of the American Osteopathic Association and one which is now before the A.O.A., by recent action of the California Osteopathic Association.

The Tasker letter denies any intent to "interfere with the professional practice rights of any physician." But it calls upon the American Osteopathic Association to terminate any direct or indirect connection with an organization that claims that the Sutherland hypotheses are established as facts. Specifically, then, the moot point raised by the Tasker report to the California Osteopathic Association is not the truth or error of "cranial osteopathy" per se (although Dr. Tasker appears satisfied in his own mind that its theories are not supportable by known and scientific methods), but its postulation, establishment, and teaching as an integral part of the osteopathic concept and the osteopathic movement in medicine. It is upon this basis that he calls for a severance of the ties that connect the Osteopathic Cranial Association with the Academy of Applied Osteopathy—a disestablishment by the A.O.A. Board and House of "cranial osteopathy" as a subaffiliate in the organized structure of the American Osteopathic Association.

The third area to be explored, and a question implicit in the Tasker letter, relates to the policy of A.O.A. official publications in handling the question of "cranial osteopathy." JOURNAL policy generally has been a matter of growth and development over many years. Within recent years its practice has been documented in the periodical itself.[3,4,5,6] Editorial policy is determined by the Editor, predicated upon the basic

2. O.C.A. News Letter, vol. 10, Sept. 1956.

3. Hulburt, R. G.: Some principles of writing for A.O.A. publications. J. Am. Osteop. A. 42:324-332, March 1943.

4. Editorial: Brief history of THE JOURNAL. J. Am. Osteop. A. 50: 23-24, Sept. 1950.

5. Editorial: THE JOURNAL. J. Am. Osteop. A. 51:493-495, June 1952.

6. Editorial: JOURNAL policy and practice. J. Am. Osteop. A. 53: 629-631, July 1954.

policies of the American Osteopathic Association as set forth by its House of Delegates and Board of Trustees. In the last analysis, an A.O.A. Editor's policy is interpretative of the will of the Association as expressed by its House of Delegates and Board of Trustees.

Journal policy

This is not the occasion to review JOURNAL policy and practice, but merely to affirm that it is not based on any predilection of the Editor and his staff. Within the last 5 years "Osteopathic Magazine" (now HEALTH: An Osteopathic Publication) and THE FORUM OF OSTEOPATHY have closely conformed to general editorial policy on the basis that they, too, are official publications of the American Osteopathic Association.

A bibliographic study has been made of all JOURNAL references to "cranial osteopathy" to date. The list is available, and it confirms the statement made above—that there has been no recognition by the A.O.A. of "cranial osteopathy" as an official entity.

A paper written by the late Dr. Sutherland, "The Cranial Bowl," was published in THE JOURNAL, April 1944. In an italicized introduction to the paper the term "cranial osteopathy" was not used (nor was it employed by the author). The Editor pointed out that "there has been hesitation about putting anything about [cranial technics] in print," on the basis that manipulative technic applied to the cranium is not to be learned from casual observation or even from an article or two in a magazine." In a review of Sutherland's monograph, also entitled "The Cranial Bowl," the Editor had previously pointed out that "if one could be as sure of these movements [mobility of the joints of the cranium and the Sutherland premise of the fluctuation of the cerebrospinal fluid] and their effects as one is sure of Dr. Sutherland's knowledge of the bony anatomy involved, the matter would be much simpler." Further, the reviewer pointed out that "it does seem regrettable that [Sutherland's] hypotheses should be placed in such permanent form when, comparatively, so few investigators seemed to have put them to the test."

As early as 1936 THE JOURNAL expressed suspended judgment on a series of articles on the cranial vertebrae which were being presented in the periodical by Charlotte Weaver, D.O. The Editor pointed out that scientists had long held with anatomists, and with Thomas Huxley (1825-1895), that the theory of cranial vertebrae had been refuted from both the anatomic and embryologic standpoints. The articles were being published, therefore, not as validated research but as an outlet to a thesis which had involved a 25-year study by an individual doctor of osteopathy—"a looking for the truth," THE JOURNAL phrased it.

From 1936 on, occasional articles have appeared in THE JOURNAL which involved the application of manipulative technics to the cranium but which did conform to its policy that "observations made by an author and the conclusions that he draws therefrom remain in the realm of personal experience until they are tested by methods of scientific investigation and not proved false . . . propositions or hypotheses so postulated must be presented and clearly identified as the author's own."[7]

It was not until June 1952, however, that THE JOURNAL presented an over-all survey of the claims of what by then was being called "cranial osteopathy." In an article-length book review of an official publication of the Osteopathic Cranial Association, the subject of "cranial osteopathy" was briefly summarized and the volume examined somewhat in detail.[8] The review was conservatively and sympathetically critical, pointing out that the theories expounded in the text appeared to "embody a belief held without scientific detachment."

The reviewer pointed out that students of "cranial osteopathy" should have the opportunity to work out their theories and to demonstrate both scientifically and clinically their tremendous hypotheses with total objectivity. That the proponents of "cranial osteopathy" organized into the Osteopathic Cranial Association with a teaching arm, the Sutherland Cranial Foundation, holding "cranial osteopathy" as an entity within the structure of organized osteopathy ("Cranial Osteopathy is established"),[9] go beyond the limits suggested in the review is the thesis of the Tasker letter.

It should be said with utter frankness, however, that the papers presented at the meetings of the Osteopathic Cranial Association, which deal with the theories, hypotheses, practices, and technics of "cranial osteopathy" per se, and the articles appearing in the *Journal of the Osteopathic Cranial Association*, together with all papers dealing primarily with cranial theories and technics which have been submitted to THE JOURNAL since May 1951, do not meet the standards set up for JOURNAL presentation.

Conclusion

The larger issue involved is not one for editorial comment. The Tasker letter raises questions far beyond the province of the Editor. But it is his province to emphasize this very fact, as he did in the article-review referred to above, stating that the questions raised by "cranial osteopathy" are inclusive of the entire field of osteopathy, involving its validation as a school of medicine in the light of today's scientific methods and knowledge.

Space has not been given to this comment on the Tasker letter to open the pages of the A.O.A. publications to controversy on the truth or error of cranial osteopathy as practiced by a limited number of doctors. A careful reading of this editorial should leave no doubt in any reader's mind that the facts have been set forth only as they relate to the question implied by the action of the California Divisional Society—the question of the continued sponsorship of the Cranial Osteopathic Association by the Academy of Applied Osteopathy as an affiliate of the American Osteopathic Association.

7. *Op. cit.*, ref. 6, p. 631.
8. Magoun, H. I., ed.: Osteopathy in cranial field. Journal Printing Co., Kirksville, Mo., 1951.
9. Magoun, H. I.: Editorial: Cranial concept and osteopathy. J. Am. Osteop. A. 47:263, Jan. 1948.

Notes and COMMENTS

"Silent Spokesman" as an aid to the speechless

THE SUBTITLE OF this manual, "an aid to the speechless," describes it precisely. Published by *Hospital Topics,* also publishers of the popular and practical journal of that name, "Silent Spokesman, an aid to the speechless" is a useful device like a hearing aid in that it is actually "a communication bridge for persons whose power of oral and written expression has been impaired or destroyed by illness, injury, or disease." The manual will be an aid not only to speech-restricted persons but to persons responsible for their care—members of their families and doctors, nurses, and attendants.

In following the now popular visual technics, the book employs the oldest and yet newest language, the language of pictures. There are key drawings and pictures of the common "personal needs" of the aphasiac—bedpan, urinal, blanket, and drink—with their designations in bold type. Then there are pictures of everyday food and articles of clothing, a pain chart and a section for "General Requests" and one for "General Questions." The text progresses from drawings and photographs of basic necessities to broader groupings and concepts. The manual could be indispensable in the care of patients speaking only a foreign language. The book should always be placed where it can be reached by the patient. This device is worthy of the serious attention of doctors and hospitals, hence this comment. For copies write Hospital Topics, 30 W. Washington Street, Chicago, Illinois. The price is only $1.50 a copy.

Cancer as cause of death in midlife

THE MONTH-TO-MONTH picture presented in the *Statistical Bulletin* of the Metropolitan Life Insurance Company of the state of the nation's health is a fascinating and challenging one to the physician who sees medicine for what it is—a social force determining the nation's welfare. A recent issue reports malignant neoplasms as ranking second to heart disease as a cause of death in middle life; that is, in the age range from 45 to 64 years. It is now estimated that one out of every eight persons reaching the age of 45 will develop cancer by age 65. The *Bulletin* reports fatal cancer in middle life as considerably more frequent among men than among women, except for the breast and genital organs. In cancer of the lung the death rate for males is 10 times more than that for women. Early detection and treatment remain the major means of control. Ultimate solution of the cancer problem depends upon research into the causes of the disease.

New developments relating to atherosclerosis

CEREBRAL VASCULAR accidents, coronary artery occlusion, and other vascular disorders are known to laymen as the chief causes today of disability and death. And there are few doctors who do not know that atherosclerosis is the culprit in the killing, even if it is rarely listed on the death certificate.

Other facts should be equally well known, professionally. Atherosclerosis is not an inevitability of the aging process, although common to it. In none of its three stages of atherogenesis—atherosis, atherosclerosis, and atherosclerosis obliterans—does it have a striking predilection for any arterial vessel in the body. It may pick on the smallest retinal arteriole or fibrose and calcify the great aorta itself.

An editorial in the July 1956 issue of *International Medical Abstracts* stresses the role of cholestesterol in artherosclerosis, pointing out that the one feature which characterizes conditions that predispose to atherosclerosis is hypercholesteremia. Among the most common of such conditions are diabetes mellitus, hypothyroidism, nephrosis, and an idiopathic hypercholesteremia—"idiopathic" is the best known euphemism for ignorance.

Still more recently, a release from the Public Health Service's National Institutes of Health states there is new evidence that excess fats circulating in the blood may result from a deficiency of lipoprotein lipase, an enzyme which normally acts to break down blood fats. The presence in the blood of abnormal quantities of the larger fatty particles is known to be associated with disease states which lead to atherosclerosis.

Research done at the Heart Institute revealed that fats eaten in a single meal by hyperlipemiac patients lingered in the circulation for as long as 2 days. In normal persons, however, dietary fats are broken down and removed from the blood within 8 hours after eating.

According to the release, Dr. Richard J. Havel,

one of its investigators, made the following statement:

. . . Hyperlipemic subjects have a strikingly decreased ability to remove chylomicrons (the largest fatty particles) from blood plasma and that this defect does not result from an intrinsic abnormality of their chylomicrons. It is also clear that these individuals liberate very little lipoprotein lipase into their plasma after administration of heparin. The simplest explanation for these observations is that the subjects studied have a congenital deficiency of tissue lipoprotein lipase. While this hypothesis remains unproved, the findings provide further evidence that lipoprotein lipase participates in chylomicron transport and suggest that lipoprotein lipase deficiency may be one cause of unexplained hyperlipemia.

Until such time as research reveals the specific etiology of atherosclerosis, the clinician will take advantage of known facts about diet in relation to prophylaxis and therapy, especially in atherogenetically susceptible individuals. He will emphasize to his patients the importance of sustained, judicious physical activity, especially of a noncompetitive recreational type. And as in all other diseases, relief from situational stress must be sought—advice from the physician to the patient placed within the human situation in the world today is much easier said than made possible.

Still unproved is the value of drugs that tend to lower blood cholesterol levels and influence favorably cholesterol-phospholipid ratios (methionine, choline, and inositol), as well as anticoagulants used routinely, e.g., heparin. Equally unknown is the value of endocrine factors, particularly polyextracts of the pancreas.

Manipulative methods in orthopedics

PATIENTS WHO ARE afflicted with back pain frequently have a hysterical overlay as well. That this overlay is exacerbated by well-meaning but misguided comments by their doctors when they are unable to find the cause of the pain is the opinion of J. F. Bourdillon, B.M., F.R.C.S., an orthopedic surgeon, in a paper titled "Manipulative Methods in Orthopaedics" which he presented before the Gloucestershire Branch of the British Medical Association on January 13, 1955, and which was published in the *British Medical Journal* for March 19, 1955. He further notes that the hysterical overlay is relieved in nearly all cases by successful treatment of the physical cause of the backache.

The author, who feels that manipulation has tremendous value in painful back problems, comments that he first used manipulation under general anesthesia but soon realized that this was entirely unsuitable for many patients, because they required manipulation more often than it could be wisely given in this way. In working toward satisfactory manipulation without anesthesia, he found that some of his patients, whom he had treated without success, had been treated successfully by osteopaths, and concluded that ". . . in spite of . . . early indoctrination against it . . ." he must learn more about osteopathy. When by chance he met a physician who was practicing osteopathy in London, he spent a week with him and was much impressed by his methods and results.

Mr. Bourdillon still uses physiotherapy, supporting garments, and plaster jackets for selected cases. However, he does feel that under osteopathic manipulative methods of treatment, his results are much improved over those he obtained with other methods. No mention is made in the article of any possible connection between spinal lesions and visceral disease, and it seems warranted to conclude that the author's experience and information lie entirely in the use of osteopathic manipulation in the correction of orthopedic problems.

Control of the infectious diseases

MOST PHYSICIANS think of infectious diseases as largely under control. As individuals, few see many cases, and so often these diseases appear to play a minor role. Yet the *Statistical Bulletin* of the Metropolitan Life Insurance Company points out that infectious diseases continue to be a major cause of sickness and death in the United States. In 1955 tuberculosis still accounted for more than 15,000 deaths, and pneumonia and influenza for about three times as many. Infectious disease are death hasteners among those afflicted with serious chronic diseases. And they take a less obvious toll—for example, not a few children annually are born with congenital malformations because their mothers had German measles during the early months of pregnancy.

Measurement of power output of heart

THE POWER OUTPUT of the animal heart is now measurable by a catheter tip method by which it is possible to calculate the velocity with which the blood is ejected at a given instant from the heart into the aorta. Public Health Service scientists expect to have the method sufficiently refined to make it applicable to human beings in the near future. The information gained will be of great value to physicians and surgeons in determining the physical abilities and limitations of heart patients and in judging the risks for particular patients of stressful experiences such as surgery. . . . The adjustment of the fluoride content of communal water to an optimal level (approximately 1 part per million of fluoride) has achieved satisfactory results as revealed by the findings from 10 years' observation of the Grand Rapids-Muskegon (Michigan) study. Reporting in the July 1956 *Public Health Reports,* officers of the Public Health Service point to a 54 to 60 per cent reduction in dental caries rate and no undesirable cosmetic effect from dental fluorosis. . . . Building facilities for research in osteopathic institutions are in line for a share of the new $90 million-3 year program of Federal grants, according to a recent release from the National Institutes of Health.

DEPARTMENT OF PUBLIC RELATIONS

CHESTER D. SWOPE, D.O.
Chairman

SBA loans to privately owned health facilities

The Small Business Administration, an Agency of the Federal Government, will provide financial assistance to hospitals, nursing homes, and similar privately owned health facilities for expansion, improvements, and general operations.

SBA's loans are of two types: participation loans, those made jointly with banks and other private lending institutions, and direct loans, where no participation is available.

WHO IS ELIGIBLE

Privately owned hospitals, nursing homes, and medical and dental laboratories, if operated for profit, are eligible for financial assistance.

Hospitals are those health facilities which are licensed as hospitals providing inpatient medical or surgical care of the sick or injured, including obstetrics, which are privately owned and operated for profit.

Nursing homes are those facilities for the accommodation of convalescents or other persons who are not acutely ill and not in need of hospital care but who may require nursing care and related medical services.

Medical and dental laboratories are those facilities which provide services to doctors, dentists, hospitals, and similar health facilities.

Besides being privately owned and operated for profit, such establishment must qualify as a small business operation. Hospitals and nursing homes will be considered small when the capacity does not exceed 50 beds at the time of the application for the loan. All laboratories shall be considered small, unless they are operated in connection with a proprietary hospital which has more than 50 beds.

PURPOSE OF LOAN

Loans made by the Small Business Administration may be for the construction of new facilities, expansion or improvement of existing facilities, or for working capital.

AMOUNT OF LOAN

The amount which the Small Business Administration may lend is limited by statute to a maximum of $250,000 to any one borrower. If a bank participates in the loan, however, the loan may be increased by the amount of the bank's participation. In any case, the total amount of a loan must be proportionate to the investment of the owners in the project.

LOAN TERMS

An SBA loan may be made for a period not to exceed 10 years. Generally, loans are made on an amortized repayment basis, usually with equal monthly installments. All, or any part of the loan, however, may be repaid without penalty before it is due, if the borrower wishes to do so.

Interest has been set at 6 per cent per annum for direct SBA loans. In loans in which SBA participates with a bank or other lending institution the rate of interest may be fixed by the lending institution, provided that the rate is no more than 6 per cent per annum. Interest is not deducted at the time the loan is made but is payable when the loan, or an installment of the loan, is due. Interest is charged only on the actual amount borrowed and for the actual time the money is outstanding.

QUALIFYING CONSIDERATIONS

a. The applicant must show that the needed financing is not otherwise available on reasonable terms from another credit source;

b. The applicant must show that the loan can be repaid out of earnings;

c. The owners and operators of an applicant facility must be experienced in their field, must be competent, and must have sufficient professional training to operate the facility in accordance with required or accepted standards;

d. When licensing is required by a state, county, or local agency, the facility must have a license in good standing or the licensing agency must indicate, in writing, that a license will be issued when the purpose for which the loan proceeds have been used are completed; and

e. An applicant will not be deemed to meet the necessary credit requirements nor to have demonstrated adequate ability to repay the loan, if its facility, after application of the proceeds of the loan applied for, does not meet the minimum standards generally accepted for such facility.

HOW TO APPLY

Before applying for an SBA loan, the owner or operator of a health facility should first determine whether his bank or other local lending institution will extend the required financing, either alone or in participation with SBA. If the private lending institution will not or cannot make the entire loan, but is willing to join with SBA in a loan to the facility, the owner or operator should obtain loan application form SBA-4 and 4D from the nearest SBA field office, complete it, and file it with the private lender. A representative in the field office will be willing to discuss the procedures with the applicant.

If the private lending institution will not make or join in the loan, the prospective borrower should then contact the SBA field office to discuss his credit problems and to apply for a direct SBA loan. His loan application must be accompanied by a letter from the private lender stating that it is unable to make the loan.

SBA makes no charge for handling a loan application or for counseling an applicant on his financial problems.

A loan applicant can insure prompt action on his application by providing full information, as requested on the Agency's loan application form and the accompanying instruction sheets.

Regional and branch offices of the Agency are as follows:

SBA Regional and Branch Offices

BOSTON 9, MASSACHUSETTS, 131 State St.
NEW YORK 19, NEW YORK, 1790 Broadway
Hartford Connecticut, 70 Arch St.
Syracuse, New York, Chimes Building, 500 S. Salina St.
PHILADELPHIA 7, PENNSYLVANIA, 1015 Chestnut St.
Pittsburgh 22, Pennsylvania, Fulton Building, 107 6th St.
RICHMOND 20, VIRGINIA, 900 North Lombardy St.
Baltimore, Maryland, Calvert Building, Fayette and St. Paul Sts.
Charleston, West Virginia, Embleton Building, 922 Quarrier St.
Charlotte, North Carolina, Independence Building, 102 W. Trade St.
ATLANTA 23, GEORGIA, Peachtree-Seventh Building, 50 7th St. N.E.
Birmingham, Alabama, 704 North 22nd St.
Memphis, Tennessee, Falls Building, 22 North Front St.
Miami 32, Florida, Pacific Building, 327 N.E. 1st Ave.
San Juan 18, Puerto Rico, Chamber of Commerce Building
CLEVELAND 1, OHIO, Federal Reserve Bank Building
Louisville 2, Kentucky, Federal Building, 6th and Broadway
CHICAGO 6, ILLINOIS, 226 West Jackson Blvd.
Davenport, Iowa, Putnam Building, 215 Main St.
Indianapolis, Indiana, Federal Building
Madison, Wisconsin, Woolworth Building, 105 Monona Ave.
MINNEAPOLIS 1, MINNESOTA, Metropolitan Building, 2nd Avenue at 3rd St.
KANSAS CITY 6, MISSOURI, Federal Office Building, 911 Walnut St.
Omaha 2, Nebraska, Federal Office Building, 15th and Dodge Sts.

St. Louis 1, Missouri, New Federal Building, 1114 Market St.
Wichita 2, Kansas, Bitting Building, 107 N. Market St.
DALLAS 2, TEXAS, 1114 Commerce St.
Houston 14, Texas, Federal Building, Fannin and Franklin Sts.
Little Rock Arkansas, U.S.O. Building, 217 Main St.
New Orleans 12, Louisiana, Masonic Temple Building, 333 St. Charles St.
Oklahoma City, Oklahoma, Bankers Service Life Building, 114 No. Broadway.
DENVER 2, COLORADO, New Customhouse, 19th and Stout Sts.
SAN FRANCISCO 2, CALIFORNIA, Flood Building, 870 Market St.
Honolulu, T.H., 440 St. Hotel St.
SEATTLE, WASHINGTON, Burke Building, 905 Second Ave.
Helena, Montana, Federal Office Building, N. Park Ave. and W. Lawrence St.
Portland 4, Oregon, Old U.S. Court House, 520 S.W. Morrison St.
Anchorage, Alaska, First National Bank Building
LOS ANGELES 15, CALIFORNIA, Western Pacific Building, 1031 S. Broadway
DETROIT 26, MICHIGAN, Post Office and Court House, 231 W. Lafayette Blvd.

DEPARTMENT OF PUBLIC AFFAIRS

DONALD M. DONISTHORPE, D.O.
Chairman

Bureau of Public Education on Health

ROSWELL P. BATES, D.O.
Chairman

Semiannual meeting of the Bureau of Public Education on Health

► The Bureau of Public Education on Health will hold its semiannual meeting in Central Office on December 3 and 4, 1956. This will be the first meeting of the Bureau held under the auspices of the new Chairman appointed in July of this year. The Bureau of Public Education on Health is now composed of Roswell P. Bates (1959), Chairman (1956-57); Eugene D. Mosier (1957), Vice Chairman (1956-57); E. A. Ward (1958); C. Fred Peckham (1959); C. E. Cryer (1957); Phil R. Russell (1958). Dr. Carl Morrison is no longer a member of the Bureau, as he is now the President-Elect of the American Osteopathic Association. His long service as Chairman did much to further the public education and health objectives of the Association; his counsel and advice in his position as President-Elect will continue to be available to the Bureau. Also no longer a member is Dr. John P. Wood who was the first Chairman of the newly reorganized Bureau following World War II and who has served as either a member or Chairman until this year. The long experience and interest of both Drs. Morrison and Wood will be missed. Their active participation in the affairs of the Bureau did much to establish its present acceptance throughout the profession.

As the time for the semiannual meeting of the Bureau approaches it is obvious that there are many matters affecting the Association's public education on health programs which will require consideration and study. In the states where state public health laws do not yet permit doctors of osteopathy to contribute fully to the public health through the utilization of their professional skill and knowledge, the program of public health education continues as the basic program of the profession. In all states, professional education is a matter of primary interest whether it is in connection with problems relating to the approval of osteopathic colleges under state licensing laws or with efforts to permit states to utilize more fully the educational facilities of the six osteopathic colleges through such programs as, for example, the Western Interstate Commission for Higher Education and other regional education programs.

The Bureau has had under study for some time the preparation of a report dealing with state health laws administered in whole or part through grants-in-aid received under the federal Social Security Act. The recent inclusion by the enactment of H.R. 7225 by the United States Congress of self-employed D.O.'s under the Old Age, Survivors, and Disability Insurance Benefits only re-emphasizes the great importance of the Social Security Act in relation to the health and welfare of the American people. Probably the most significant of the 1956 amendments of the Social Security Act is the one that now provides for the payment of disability insurance benefits to workers prematurely forced into retirement at age 50 or over and prior to the time they attain 65 because of permanent and total disability. The payments of such disability benefits will commence on July 1, 1957. Generally speaking, it has been said that disability determination, including the beginning and ending dates of periods of disability, will be made by state agencies approved under the Vocational Rehabilitation Act or other appropriate state agencies. Disabled workers under the Act may be denied benefits for any month in which the individual refuses, without good cause, to accept rehabilitation services available to him under a state plan approved under the Vocational Rehabilitation Act. Thus each state rehabilitation plan will have a much greater significance after the implementation of the disability benefit provisions occurs.

It is frequently not recognized that the Social Security Law includes under its some fifteen different Titles not only Old Age, Survivors, and Disability Insurance Benefits (Title II of the law), but also the sources of grants-in-aid to state health and welfare plans. Most of these other Titles relate to or affect state medical care and welfare programs. While physicians are frequently familiar with the health and welfare plans at state level, they do not always recognize that the source of a part of the funds for medical or surgical care may be under the Social Security Law. Title I of the law, for example, pertains to Old-Age Assistance; Title IV, to Aid to Dependent Children; Title V, to grants to state for Maternal and Child Welfare, including Part 2 pertaining to Services for Crippled Children and Part 4 pertaining to Vocational Rehabilitation. Title X pertains to Aid to the Blind. Title XI pertains to General Provisions including definitions, and it is section 1101(a)(7) which provides:

> The terms "physician" and "medical care" and "hospitalization" include osteopathic practitioners or the services of osteopathic practitioners in hospitals in the scope of their practice as defined by State law.

Title XIV pertains to Aid to the Permanently and Totally Disabled.

These and other matters will be the basis for the agenda of the Bureau of Public Education on Health at its semiannual meeting. The Bureau is interested in receiving from the Bureaus of Public Education on Health of divisional societies any comments, suggestions, or problems which they believe should be a matter of study at the forthcoming Bureau meeting. Please send any such comments to the Chairman of the Bureau of Public Education on Health in care of the Central Office.

Current Literature

Peptic ulcer and pulmonary emphysema

▶ IN THE MAY, 1956, issue of the *Archives of Internal Medicine*, Elliot M. Latts, M.D., James F. Cummins, M.D., and Leslie Zieve, M.D., report upon the association of peptic ulcer with pulmonary emphysema in 586 hospitalized male patients.

Of the patients studied, 479 were seen clinically and 107 were autopsied. Most of the patients were in their sixth decade of life. Results of the study showed that of those patients seen clinically on whom an evaluation was made, approximately 50 per cent had severe emphysema without relation to the presence or absence of peptic ulceration. Among the autopsied patients, a larger proportion of those with peptic ulcer had severe emphysema.

The specific incidence of peptic ulcer in the emphysema patients was as follows: In the clinical group, 15.4 per cent had peptic ulcer, 21.3 per cent had no ulcer but showed signs and symptoms, 63.3 per cent had no ulcer and showed no signs or symptoms. In the autopsied group, 27.1 per cent had peptic ulcer, 15.9 per cent had no ulcer but showed signs or symptoms, and 57 per cent had no ulcer and showed no signs or symptoms. Of those patients having known ulcers, 24 per cent of the clinical group and 41 per cent of the autopsied group had gastric ulcer, 83 per cent (clinical) and 79 per cent (autopsy) had duodenal ulcer, and 7 per cent (clinical) and 21 per cent (autopsy) had both. Complications included bleeding, obstruction, perforation, and combinations of these.

From their study the authors conclude that approximately one fifth of hospitalized patients with pulmonary emphysema have associated demonstrable peptic ulcer, and two fifths have either an ulcer or symptoms and signs of ulcer. This incidence is sufficiently high to warrant routine suspicion of peptic ulceration in any emphysematous patient with gastrointestinal symptoms. Such awareness can do much to help avoid some of the serious complications which occur.

There are few factual data to explain the association of peptic ulcer and pulmonary emphysema. Speculation would indicate that there may be a relationship between carbon dioxide tension and gastric acid secretion in the patient with emphysema. Moreover, the emotional moods of hostility and resentment, commonly found in emphysematous patients, contribute to increased acid secretion. Also, hormonal factors may play a prominent role in the production of peptic ulceration and, for this reason, the therapeutic use of steroids in emphysematous patients should be approached with caution.

External cod liver oil in proctology

▶ AFTER 2 YEARS' USE, in a variety of proctologic conditions, of rectal Desitin cod liver oil ointment and suppositories, Manuel G. Spiesman, M.D., and Louis Malow, M.D., conclude that this is the most satisfactory medicament they have found for treatment of anorectal ailments. They report their findings in the June, 1956, issue of *The American Journal of Proctology*.

A satisfactory anorectal ointment should be light in color, bland, harmless, painless, nonirritating, and nonsensitizing, and it should inhibit the growth of bacteria, stimulate granulation tissue, and accelerate healing while retarding infection. Rectal Desitin ointment, which is a smooth, stable combination of high grade Norwegian cod liver oil, zinc oxide, lanolin, talcum, sodium lauryl sulfate, and petrolatum q.s., meets all of the necessary requirements.

Proctologic indications for external use of cod liver oil include: in pediatrics, congenital narrowing of the anal canal, anal fissure, and gonorrheal proctitis; and, in adult practice, abscess; bacillary dysentery; chancroidal proctitis and anal ulcer; colostomy wounds; cryptitis and papillitis; factitial (postradiation) proctitis; fissure-in-ano; fistula; fecal impaction; foreign bodies in the rectum; gonorrheal proctitis; neurodermatitis of the perianal area; pilonidal cysts; proctitis; postoperative anal stenosis; pruritus ani; postoperative treatment of hemorrhoids, fissure, crypt, papilla, fistula, et cetera; pectenosis and pectenotomy; psoriasis and eczematous dermatitis (perianal); tuberculous colitis and fistulas; ulcerative colitis; and hemorrhoids (nonsurgical).

Over a 2-year period, no sensitization to cod liver oil ointment or suppositories was noted.

Venostomy, an improved "cut-down" procedure in infants and children

▶ A NEW METHOD for facilitating the introduction of a polyethylene tube into the vein of an infant or child is described in the June 16, 1956, issue of *The Journal of the American Medical Association* by James V. Miles, Jr., M.D., and Lloyd E. Harris, M.D. They call the procedure "venostomy."

Venostomy is indicated when veins are hard to find for venocylsis, when a child is being prepared for surgery, when shock, peripheral circulatory collapse, or some other such emergency has occurred, and when intravenous therapy is predicted for an extended period. The vena saphena magna anterior to the medial malleolus of the tibia, the vena basilica and vena mediana cubiti, and the venae metacarpeae dorsales are the veins most frequently used in this procedure.

If the vein to be entered is located accurately, only a small incision is required. The use of a tourniquet usually causes sufficient distention to make the vein palpable or visible. The site of the incision is cleansed first with soap and water and then with a germicide. The extremity chosen for venostomy should be securely taped to a padded board or sandbag and the other extremities tied to the side of the bed or table. The incision site is repainted with disinfectant and draped.

Sufficient 1 per cent solution of procaine hydrochloride is injected just beneath the skin immediately over the vein to cause a skin elevation approximately 1 cm. in diameter. The incision is made transverse to the long axis of the vein and not more than 5 to 6 mm. in length. The point of a mosquito forceps is inserted into the incision and opened to spread the skin and subcutaneous tissues. The vein may be seen at this point. A self-retaining retractor is next inserted and, if the instrument is placed properly, the vein should lie between the two opposing pair of teeth and should be visible throughout the remainder of the procedure.

A vein dissector is used to incise the sheath of the vein and to free the vessel completely from its sheath tissues and underlying attachment. With the vein in this position, a V-shaped nick is made in the vein with either ophthalmic scissors (sharp-sharp) or the point of a No. 11 Bard-Parker blade. A polyethylene tube (size 90 recommended), which has previously been washed with sterile sodium chloride solution, is inserted carefully into the vein for a distance of 4 to 10 cm. The tubing is mounted on a blunt needle hub.

At the conclusion of the procedure, the retractor and drapes are removed, and a sterile dressing is applied firmly over the

venostomy site to promote hemostasis and to prevent contamination. The needle hub and external length of the tube are anchored to the contour of the foot and restraint board with adhesive tape.

Because no sutures are used, the frequency of infection at the venostomy site is reduced, and foreign-body reaction is eliminated. Adequate skin preparation and the use of a small incision aid in the reduction of wound infection and excessive scar formation.

An experienced operator can perform this procedure from incision to bandage in about 2 minutes.

Procedure to reduce dislocation of the shoulder

▶ ENEAS BRASILIENSE FUSCO, M.D., describes a technic for reducing dislocation of the shoulder in the July, 1956, issue of *The Journal of Bone and Joint Surgery*. This procedure has been employed in twenty-four patients (one with bilateral dislocation) with acute and recurrent luxations, in patients of different ages and with different types of dislocations. Successful reduction was accomplished in twenty-three instances.

As in all methods for reducing dislocation, this procedure has as its fundamental aim: (1) to overcome the muscular spasm which appears after luxation, and (2) to readjust the joint in its normal position without increasing the damage to the articular structures which is already present due to the luxation.

Three steps are required to perform this operation: fixation, rotation, and traction. Specific maneuvers are given in detail. Advantages of this technic are listed as: (1) It can be carried out by the orthopedist without assistance or anesthesia. (2) It may be performed without the active cooperation of the patient if assistants are available to rotate the patient's body. (3) There is no danger of fracture of the surgical neck of the humerus. (4) The procedure avoids danger of injury to vascular and nervous structures.

The disadvantages of the procedure are: (1) It is not always successful. (2) The procedure is tiring to the orthopedist when obese or large patients are treated. (3) Its use is impractical when other injuries, such as fractures of the lower extremities, pelvis, and the like, exist.

Roentgen therapy of chronic chest symptoms in elderly

▶ COUGH, SEVERE and/or long-lasting pain, dyspnea, and orthopnea are the important chest symptoms which result in debility, exhaustion, and generally poor health in the aged. The effectiveness of roentgen therapy in the alleviation of these symptoms when caused by inflammatory conditions is discussed by Anthony F. Rossitto, M.D., in the April, 1956, issue of the *Journal of the American Geriatrics Society*.

The most important chest symptom to control in the elderly is cough, either alone or with dyspnea and pain. The commonest causes of cough seen by the author are unresolved pneumonia; fibrosis of the hilar, perihilar, and medial lung areas; and hilar and mediastinal chronic inflammatory adenopathy. In all of these conditions, infection must be predominant in order to achieve effective response with x-ray therapy.

The doses of irradiation are small and are given twice weekly for 2 weeks and then at 7-, 10-, or 14-day intervals. Response is expected by the end of four treatments. A total of eight or ten treatments is usually given, by which time cough should have disappeared or become an insignificant symptom. In instances of pulmonary fibrosis, a second course of treatment is usually needed to control the dyspnea and orthopnea which accompanied the cough.

When fibrosis of the lungs, emphysema, bronchiectasis, or pulmonary cysts are present, a single or repeated attack of acute infection usually results in symptoms of dyspnea and orthopnea which are of catastrophic proportions. Roentgen irradiation will alleviate these symptoms by promoting resolution of the infection and resorption of the fibrosis. This latter response allows some return of elasticity in the lung and consequently pulmonary ventilation is increased.

An erroneous diagnosis of cardiac dyspnea sometimes is made in these cases. Roentgen therapy, therefore, can be used as a method of differentiating the dyspnea caused by chronic pulmonary inflammatory changes from the dyspnea of chronic cardiac decompensation.

Sinus and postnasal infection often accompanies pulmonary pathologic conditions. If otolaryngologic therapy does not produce response, roentgen therapy should be applied to the sinus areas. Sinus treatments should be given between dates of chest treatments. One course of treatments usually eliminates or controls sinus attacks and chest colds.

Pain in the chest may be the result of numerous etiologic factors. Those conditions which respond well to roentgen therapy include: (1) pleurodynia, intercostal neuralgia, and herpes zoster, (2) fibrositis and osteoarthritis with nerve-root syndrome, and (3) chronic mediastinal inflammatory adenopathy. In the first group, a total of three or four treatments is given at 2- or 3-day intervals. In the second group, four to eight treatments are required for good response. In the third group, a higher dosage is required and roentgen irradiation is administered twice weekly for four treatments and then weekly and semimonthly for an additional four to eight treatments.

When all other means short of radical measures have been used, roentgen therapy should be instituted to help differentiate the following: primary lung, mediastinal and hilar tumors from chronic inflammatory pathologic lesions in corresponding areas; allergic from infectious conditions in the hili and perihilar areas; pulmonary interstitial fibrosis from chronic inflammatory pulmonary changes; and chronic pulmonary inflammatory conditions from the appearance of the lungs in chronic decompensated heart disease.

A new injector designed to minimize pain and apprehension of parenteral therapy

▶ IN THE APRIL 14, 1956, issue of the *Journal of the American Medical Association*, Frank H. J. Figge, Ph.D., and Vernon M. Gelhaus, M.D., describe and evaluate the Presto injector, a device which was designed and developed to mimimize needle pain caused by stimulation of pain fibers and to reduce psychologic reaction to needle injections. The investigators believe this device to be the most satisfactory injector to appear so far. It is particularly valuable to patients who must make routine self-injections over long periods and to children and others who are unduly apprehensive of such procedures.

The intensity of any type of stimulus, including pain, is registered in the nervous system by means of spatial and temporal summation of impulses. Therefore, pain of injection procedures can be minimized either by reducing the area of stimulus (i.e., use of fine bore jets) or by reducing the duration of stimulus. In developing the Presto injector, the major effort was directed toward shortening the time of the stimulus without regard to the size of the needle used.

To test the effectiveness of the injector, fifty healthy subjects submitted to each of five types of injection procedures: injection by Presto injector, by two different semiautomatic injectors, by manual syringe with the needle hidden, and by manual syringe with the needle exposed. Reactions were recorded in five categories: no sensation, slight sensation, slight sting, sting, and pain. The Presto injector proved to be superior, with no person reporting a reaction more intense than a slight sting. Manual injection produced the greatest number of painful reactions. The Presto injector was also tested for a year by a family in which the mother required an injection of vitamin B_{12} three times a week. During 123 injections, no sensation was felt; a slight stinging sensation was reported twenty-seven times.

Among the advantageous features of the Presto injector are: (1) concealment of the needle and most of the syringe

which results in a remarkable psychologic decrease in pain response, (2) a trigger device which automatically releases the needle and hence eliminates much of the nervous tension attending self-injection, (3) a depth regulator which allows for either shallow subcutaneous or deep intramuscular injections, and (4) a spring mechanism which insures a needle velocity of approximately 1 cm. per 0.01 second, or a time lapse of 0.003 seconds for the needle to penetrate the superficial layer of pain fibers in the dermis. This is two to three times faster than manual introduction performed as rapidly as possible. A sterile needle and syringe, filled in the usual manner, are used in conjunction with the injector.

Finally, the Presto injector is small, light-weight, and can easily be carried from place to place. It is not dependent upon electric current and need not be sterilized. Because of the additional maneuver required to place the filled syringe in the injector, doctors may find its use time-consuming compared to manual methods. Greatest demand for it should come from persons who require self-injection of drugs in a routine continuous manner.

BOOK REVIEWS

▶ DISEASES OF THE SKIN. By Richard L. Sutton, Jr., A.M., M.D., F.R.S. (Edin.), Chairman of the Department of Dermatology, University of Kansas Medical Center. Ed. 11. Cloth. Pp. 1479, with illustrations. Price $29.50. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1956.

In this eleventh edition of "Diseases of the Skin," the dermatologist son of a renowned dermatologist follows the precedent set by his father. The volume is monumental in size (1479 pages) and complete to the point of mentioning practically every dermatologic entity or syndrome propounded in modern times.

The book is dated in some degree by the reproduction of prints of previous editions. However, there are many new and refreshing additional pictures. The text tends to go into great detail in reporting references, and, unfortunately, many of the references from previous editions have not been dropped so that older drugs are still mentioned where they might better have been omitted.

The text is international in its scope, discussing the infections and parasitic diseases occurring throughout the world. It is very thorough and complete in its coverage, particularly of malignancies.

This book is of great importance to dermatologists as a source of reference and information about the rare and unusual, but it is also useful because of its discussions of the more common dermatologic problems and their complications. It would be particularly valuable to the internist as well as the dermatologist, and it is a must in all hospital libraries.

A. P. Ulbrich, D.O.
D. Koprince, D.O.

▶ SUBPHRENIC ABSCESS. By H. R. S. Harley, M.S., F.R.C.S., Consultant Thoracic Surgeon to the United Cardiff Hospitals and to the Welsh Regional Hospital Board. Cloth. Pp. 216, with illustrations. Price $7.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1955.

Having made a study of the literature and of the case histories of 188 patients, the author set down this monograph to record his findings. It is most thorough, dealing with the anatomy of the subphrenic region, the etiology of the infection, complications, treatment of both disease and complication, and other pertinent data surrounding the subject. The book is liberally illustrated with line drawings, charts, and a number of x-ray reproductions, and has an excellent bibliography. Indexing would have been helpful, but the table of contents partly suffices, since coverage of the subject is narrow and intensive rather than broad and sketchy.

Feeling that the mortality rate in this disease is much too high (about 40 per cent in the cases involved in this study), the author estimates that early diagnosis and accurate localization of the abscess, plus correct methods of treatment, should reduce this rate to about 10 per cent. In his discussion of treatment, he puts emphasis on the importance of chemotherapy and the route of drainage. He strongly propounds the universal adoption of extraserous approaches to the subphrenic spaces. With his definite proposals, though, he is careful of unfounded statements, and his material is certainly presented in a methodical manner. The book should furnish a worth-while contribution to the field, and be an excellent reference for the physician.

▶ EMOTIONAL HAZARDS IN ANIMALS AND MAN. By Howard S. Liddell, Ph.D., Professor of Psychobiology, Director of the Behavior Farm Laboratory, Cornell University, Ithaca, New York; Formerly, Professor of Physiology, Ithaca Division, Cornell University Medical College, Ithaca, New York. Paper. Pp. 97. Price $2.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

The author of this book is both a behaviorist and a humanist; his book, an engrossing account of conditioning procedures used on animals and their reactions—the anticipated laboratory results and the unexpected, sometimes humorous, often pathetic, carryovers into their pasture life. Appropriately the book shows the great susceptibility of the body to mental and emotional conditioning, yet closes with confidence in the "creative impulse" of mankind.

▶ CLINICAL STUDIES IN NEUROLOGY. By Harry Lee Parker, M.S., M.D., F.R.C.P.I., Professor of Neurology, Mayo Foundation, Graduate School, University of Minnesota; Senior Consultant, Section of Neurology, Mayo Clinic, Rochester, Minnesota. Cloth. Pp. 364. Price $6.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

Gaining vicariously the stimulation of learning under a teacher who sees beyond the didactic impartation of bare facts into the broad arena where fellow-humans suffer certain ills, we walk the wards of a Dublin hospital for Tuesday morning clinical instruction classes. And here, as undergraduates or postgraduates, we meet patients who are more than cases; they are people. We study some of the common neurologic diseases, and a few uncommon, from these representative cases, and when we have closed the book, we discover in ourselves a new sense of interest in the disease and its victim.

Here is a book high in human interest, which maintains that informal type of teaching that seems deceptively simple, but has a way of being assimilated into the intellectual veins with astonishing practicality. No attempt is made to be "all things to all men." While scientific terminology is accurate, there are no cut-and-dried "charts" to be followed in diagnosis and cure. It is, rather, the "echo of what went on in the [author's] wards during . . . twelve years," when "students

were taught to see, to hear, to feel and even, as young puppies, to rub their noses in the foul odor of disease." The figure is intriguing, and somehow expresses well the sort of "neurological wallowing" which we enjoy with them.

▶ CLINICAL ORTHOPAEDICS. Number Seven. By Anthony F. DePalma, Editor-in-Chief. With the Assistance of the Associate Editors, the Board of Advisory Editors, and the Board of Corresponding Editors. Cloth. Pp. 354, with illustrations. Price $7.50. J. B. Lippincott Company, East Washington Square, Philadelphia 5, 1956.

This new member of the series opens with special attention directed toward bone tumors, which is followed by a section dealing with general orthopedics. Section III is a special treatment of motorist injuries and motorist safety. The guest editor for this last section, Jacob Kulowski, M.D., of Saint Joseph, Missouri, has investigated the injury-producing factors peculiar to automobile accidents and has grouped the injuries for discussion of treatment and complications. He discusses the crush syndrome and residual disabilities of the general skeletal structure and of the neck and back, specifically. The volume continues the craftsmanship of the earlier volumes and will be a valuable reference on the shelves of all those handling orthopedic cases.

▶ BACKACHE IN WOMEN. By E. Schleyer-Saunders, M.D., F.I.C.S. With a Foreword by W. C. W. Nixon, M.D., F.R.C.S., F.R.C.O.G., Professor of Obstetrics and Gynaecology, University College Hospital Medical School, London. Paper. Pp. 80, with illustrations. Price $2.25. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1955.

The common complaint of "backache" has claimed the attention of the author for many years, and he has made a special effort to learn causes and cures. Being a gynecologist, his attention has been directed to the needs of women, who suffer most from this malady (two out of every three, says one of the doctors he quotes).

The result of his study is a practical little handbook, in which he enumerates types, causes, how to diagnose, and how to treat. He does not fall into the common fault of attributing all difficulty to the cause which happens to be his specialty, but states quite clearly that backache may be the result of three main disorders—grouped as gynecologic, orthopedic, and rheumatic, with minor causes being intestinal, urologic, and neurotic. Because it is such a small work, it is by no means exhaustive, nor is the bibliography quite adequate. However, it is valuable as far as it goes and should find wide use among physicians in our profession.

▶ MEDICAL TERMS. Their Origin and Construction. By Ffrangcon Roberts, M.A., M.D., F.F.R. Ed. 2. Paper. Pp. 88. Price $2.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1955.

Most medical men, says Ffrangcon Roberts, are strangers to the classics and consequently are unaware of the richness and full meaning of the language of their profession. If they knew more of the origins and developments of the words they use, they could enjoy their work more. In addition, they would take pride in the orderly structure which has been built. This structure, however, does have flaws—words wrongly formed which still persist and are blocks in the profession. Aware that research is bringing rapid expansion and that the concept of new discoveries will be only as accurate as their names, Dr. Roberts believes that doctors must know how their language has been formed in order to properly name new discoveries.

Part one of his manual treats briefly—perhaps too briefly for the curious reader—the ways in which words come into being, are accepted, and, although later found erroneous, continue in use. He explains how words have come from other languages, from theories of disease, and from historic or mythologic personages, and on what principles they have been put together. The second section, modelled after "Roget's Thesaurus," lists under associated subject headings words and their derivation. This list avoids repetition by leaving stems once explained to be recognized in later compounds. The listing by association brings out synonyms, antonyms, and shadings in meaning. A scholar aware of the danger of oversimplification, he ends this section with a list of words not to be confused either in meaning or in formation of new words. Indexing by word and subject enables quick reference use.

This book would be useful to a student seeking a basis in medical terminology, satisfying and entertaining to the physician desiring familiarity and ease with professional terminology, and invaluable to a research person for whom the expansion of medical thought and terminology is a vital concern. It would be an excellent reference for the layman who wants insight into the esoteric terminology of the doctors. It is probable that he would find their language as colorful and rich and perhaps more logical than his own.

▶ ANESTHESIA IN OPHTHALMOLOGY. By Walter S. Atkinson, M.D., Associate Clinical Professor of Ophthalmology, New York University Post-Graduate Medical School, House of the Good Samaritan, Watertown, New York. Paper. Pp. 101, with illustrations. Price $3.25. Charles C. Thomas, Publisher, 301-327 East Lawrence Ave., Springfield, Ill., 1955.

This book was written to present in detail the generally accepted methods of obtaining local anesthesia in ophthalmology and to give enough information regarding general anesthesia to enable the ophthalmologist to discuss and choose wisely in conjunction with the anesthetist.

The book considers individual patient needs in regard to preanesthetic preparation, and then proceeds to a discussion of local anesthesia, including diagrams of the facial structure as well as photographs showing points of injection both in relation to the skeletal frame and the fleshed human face. It cites possible emergencies and gives prescribed treatment. The discussion of general anesthesia is relatively brief, characterized by mention of occasions for use, chief advantages, and disadvantages. The book has a bibliography and an excellent index.

▶ ELECTROCARDIOGRAPHY—Fundamentals and Clinical Application. By Louis Wolff, M.D., Visiting Physician, Consultant in Cardiology and Chief of the Electrocardiographic Laboratory, Beth Israel Hospital; Assistant Clinical Professor of Medicine, Harvard Medical School. Ed. 2. Cloth. Pp. 342, with illustrations. Price $7.00. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

Reviews of the first edition praised the accurate conciseness of the author's explanations of the basis of electrocardiography and also anticipated continuing new developments in clinical application. In keeping with this, the first part of the book, the explanation of basic principles, is relatively unchanged. However, studies in vectorcardiography have occasioned complete rewriting of the chapter on myocardial infarction and more detailed analysis of the properties of the volume conductor and meaning of leads as well as the addition of numerous diagrams and new electrocardiograms. There is also a new section dealing with the arrhythmias.

▶ HYPERTENSION. A Manual for Patients with High Blood Pressure. By Irvin H. Page, A.B., M.D., Director, Research Division, Cleveland Clinic Foundation; President of the American Heart Association, Cleveland, Ohio. Ed. 2. Cloth. Pp. 109, with illustrations. Price $3.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

It is better to inform an interested, mature patient than to keep him in ignorance concerning the cause and treatment of his affliction. This is particularly true when best treatment requires close cooperation and trust between physician and patient as in the case of hypertension. The first edition of Dr. Page's manual for patients went through six printings. The present edition has been enhanced by a broader discussion of the questions posed by arteriosclerosis and a frank and fuller explanation of many new drugs and methods of treatment. The doctor politely, but firmly explodes many lay-myths concerning hypertension

and, exhibiting full knowledge of patient's behavior, cautions them against the many little deceptions by which they can mislead or confuse their doctor and possibly harm themselves.

Dr. Page writes informally—the book gives the impression of an office interview recorded, then edited. In addition to the doctor's easy style, the book is easy to handle and the type and make-up easy to read. In fact, it is the type of book the doctor suggests his patients peruse while awaiting sleep. In addition to being a book which a doctor may confidently give his patient, it is also a book with an approach a doctor may profitably follow in dealing with his own hypertensive patients.

▶ MODERN OPERATIVE SURGERY. Volume I. Edited by the late G. Grey Turner, LL.D., D.Ch., M.S., F.R.C.S., F.R.A.C.S., F.A.C.S., Professor of Surgery in the University of London and Director of the Department of Surgery at the British Postgraduate Medical School; Surgeon, Hammersmith Hospital; Emeritus Professor of Surgery in the University of Durham; Honorary Consulting Surgeon, Royal Victory Infirmary, Newcastle-upon-Tyne; and Lambert Charles Rogers, V.R.D., M.Sc., M.D., F.R.C.S., F.R.C.S.E., F.R.A.C.S., F.A.C.S., Professor of Surgery, University of Wales; Director of Surgical Unit, Cardiff Royal Infirmary; Surgeon, United Cardiff Hospitals; Adviser in Surgery, Welsh Regional Hospital Board; Consultant in Neurosurgery to the Royal Navy; Member of Council and formerly Member of Court of Examiners and Vice President, Royal College of Surgeons of England. With a foreword by Sir Gordon Gordon-Taylor, K.B.E., C.B., M.A., LL.D., Sc.D., M.D., M.S., F.R.C.S., F.R.C.S.E., F.R.C.S.I., F.R.A.C.S., F.A.C.S. Ed. 4, in two volumes. Cloth. Pp. 1229, with illustrations. Price $15.00. Paul B. Hoeber, Medical Book Department of Harper & Brothers, 49 E. 33rd St., New York 16, 1956.

Volume I of the new edition of this classic of surgery reflects the scholarship and experience which have made it a standard work. The list of contributors is imposing, and many articles were contributed by the late editor, G. Grey Turner, who died before the present edition could be brought to print. His assistant, Lambert Charles Rogers, has carried on his work, even as Dr. Turner continued the labors of the first editor, H. W. Carson. The high traditions of this textbook in content, production, and illustration are upheld and insure this volume and its companion a welcome place on the bookshelves of surgeons.

▶ ANGIOCARDIOGRAPHIC INTERPRETATION IN CONGENITAL HEART DISEASE. By Herbert L. Abrams, M.D., Assistant Professor of Radiology, Stanford University School of Medicine; and Henry S. Kaplan, M.D., Professor of Radiology, Stanford University School of Medicine. Cloth. Pp. 233, with illustrations. Price $11.75. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

Because prompt and precise identification of congenital cardiac anomalies allows best treatment, this volume of diagnostic principles has been published. The methods employed are primarily those of intravenous rather than intracardiac angiocardiography and retrograde brachial rather than carotid or catheter aortography. General considerations of the technics and the dangers inherent in them open the text; discussion of specific anomalies follows. After a summation of pathologic, physiologic, clinical laboratory, and electrocardiographic and conventional roentgenographic findings common to each disorder, there is a description of the angiocardiographic findings, illustrated by roentgenographic reproductions and line drawings. An evaluation of the usefulness of angiocardiography and aortography closes each section. Each chapter closes with a list of pertinent references. A table of differential diagnosis and a glossary of abbreviations are included.

▶ TREATMENT OF HEART DISEASE—A Clinical Physiologic Approach. By Harry Gross, M.D., F.A.C.P., Attending Physician, the Montefiore Hospital; Assistant Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons; and Abraham Jezer, M.D., Attending Physician, the Montefiore Hospital; Assistant Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons. Cloth. Pp. 549, with illustrations. Price $13.00. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

"Why another book on cardiology?" The authors reply that they wish to present therapy of heart disease based upon physiologic principles. Their book is for the general practitioner, with the hope that this approach will give clearer understanding of symptoms and the clinical course. Divided into seven parts—cardiac physiology, degenerative diseases, inflammation of the heart, congenital anomalies, effects of surgery and pregnancy, effects of metabolic disturbances and vitamin deficiencies, and adjustment to emotional disturbances and rehabilitation, the book offers detailed discussion of the uses of digitalis, quinidine, mercurials, and diets as well as antibiotics and steroids. Their failures and patients' adverse reactions to the drugs are also discussed. Criteria affecting surgical intervention in rheumatic heart disease, treatment with the recently developed antihypertensive blocking agents, and ambulatory treatment of heart failure have been reviewed. Special attention has been given to the treatment of congenital heart disease, especially the use of surgery, and comment on thyroid function is detailed with current medical and surgical treatment. Extensive references appear at the end of each chapter. For the practitioner's aid in diet therapy, a detailed appendix offers diets, menus, and recipes, as well as lists of sodium and potassium content of foods.

▶ OBSTETRIC PRACTICE. By Harold Speert, M.D., Associate in Obstetrics and Gynecology, Columbia University College of Physicians and Surgeons, and Assistant Attending Obstetrician and Gynecologist, The Presbyterian Hospital; and Alan F. Guttmacher, M.D., Director of the Department of Obstetrics and Gynecology, the Mount Sinai Hospital, and Clinical Professor of Obstetrics and Gynecology, Columbia University College of Physicians and Surgeons. Cloth. Pp. 478. Price $7.00. The Blakiston Division of the McGraw-Hill Book Company, 330 W. 42nd St., New York 36, 1956.

This volume is designed to meet the needs of the general practitioner who is called upon to render obstetrical service. The authors have compiled a practical, up-to-date guide to assist the physician in the actual care of his patients.

A comprehensive general picture of obstetrical practice is presented in well-arranged, clearly written, logical form. All the various diseases and disorders of pregnancy are considered, as well as the problems of labor and operative obstetrics which the physician may encounter. Fetal growth and orientation, analgesia and anesthesia, care of newborn infants, and postpartum care are also discussed.

The index is extensive enough to make this text a valuable working reference. The lack of illustrations should not be a detriment, for the authors assume the reader has some previous familiarity with the subject; therefore bibliographical references, theoretical discussions, and chapters on anatomy and physiology are also omitted. Emphasis is placed rather on practical clinical problems and their management and on the interplay of medicine, surgery, and therapeutics with the problems of obstetrics.

▶ HEALTH OBSERVATION OF SCHOOL CHILDREN. A guide for helping teachers and others to observe and understand the school child in health and illness. By George M. Wheatley, M.D., M.P.H., Third Vice-President, Health and Welfare, Metropolitan Life Insurance Company; and Grace T. Hallock, Coauthor of Health for Better Living Series, Understanding Health, Health Heroes Series, and other health books. Ed. 2. Cloth. Pp. 488, with illustrations. Price $6.50. McGraw-Hill Book Company, 330 W. 42nd St., New York 36, 1956.

The value of the first has more than justified the publication of this second edition. Naturally there are changes and additions, most noticeably in regard to poliomyelitis and the projected effects of Salk vaccine, the progress in the search for an influenza vaccine, the relation of emotional upsets to allergies, a report on a pilot study of factors affecting the incidence of child accidents, and new methods of artificial respiration and frostbite treatment. The dual goals of presenting the structure and mechanism of normal mental and physical health and pinpointing signs which spell the more common diseases have been retained. Check lists, suggested activities, selected reading references, and names of involved agencies appear at the end of each chapter. A selected film list keyed to each chapter and a list of health agencies cited appears at the end of the book.

The widespread and professionally acknowledged need for such a book is, however, a severe indictment of current public

school health programs. It is an indictment of routine physical examinations which—in addition to upsetting the school program for a day or several days—too often attribute possible symptoms to growing pains or a hangover from last week's cold. It is an indictment of health education classes which speak glibly of viruses, complexes, and allergies, but which ignore objective, common-sense, lay observation and understanding of what is and is not healthy in the human body and mind. If these programs of public health education were fulfilling their functions, this book would be heralded not as a long overdue, acutely needed text, but as a sound review and handbook.

▶ CHRISTOPHER'S TEXTBOOK OF SURGERY. Edited by Loyal Davis, M.D., Chairman of the Department of Surgery, Northwestern University Medical School. Ed. 6. Cloth. Pp. 1,484, with illustrations. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

Several changes are apparent in the sixth edition of this fine textbook, resulting not only from a change in editorship but also from the tremendous advances being made in the ever-widening field of surgery. The acquisition of facts has been so rapid as to render impossible the teaching of surgery in a single volume. This edition, therefore, attempts to present the facts and principles which should form the basis of continuing self-education in surgery throughout the student's professional life.

While the method of presenting separate subjects by separate authors remains the same, contributors have been given broader segments of surgery for discussion, resulting in a more cohesive text and a kinship of philosophy throughout. Most of the chapters deal with the same subjects as in previous editions, but they are arranged in somewhat different sequence. Two new chapters are incorporated—the first one on the history of surgery and the last on qualifications of a surgeon—which reflect the essential purpose of the book, that of stimulating further reading and investigation. The references given at the end of each chapter are usually extensive, and the index is extremely comprehensive. Illustrations, while not used profusely, are exceptionally fine. On the whole the book is handsomely produced.

The list of contributors is a distinguished one, representing an extraordinary accumulation of clinical insight, experience, and skill. From their biographical sketches, an innovation with this edition, it is obvious that these physicians have the authority and capabilities necessary to produce a text which is a mirror of modern surgery.

▶ ORAL CANCER AND TUMORS OF THE JAWS. By George S. Sharp, M.D., F.A.C.S., F.A.C.R. (Ther.), Professor of Pathology, School of Dentistry, Assistant Clinical Professor of Surgery, School of Medicine, University of Southern California; Director, Pasadena Tumor Institute; Weldon K. Bullock, M.D., M.Sc. (Path.), Associate Clinical Professor of Pathology, School of Medicine, University of Southern California; Surgical Pathologist, Los Angeles County Hospital; and John W. Hazlet, D.D.S., Lecturer, Oral Tumor Pathology, School of Dentistry, University of Southern California. Cloth. Pp. 561, with illustrations. Price $15.00. The Blakiston Division, McGraw-Hill Book Company, 330 W. 42nd St., New York 36, 1956.

Five per cent of all cancers originate in the mouth; however, all too often diagnosis is not made soon enough because early or vague symptoms are missed in the first patient-physician or patient-dentist contact. Since oral cancer usually gives but one opportunity for its eradication—even with the advantages of antibiotics and surgery, such an oversight may be fatal for the patient. The author maintains that the next big drop in cancer mortality rates will result from improved methods of early diagnosis—in oral cancer the rate would be at least 50 per cent. This syllabus is intended as a ready-reference guide to illustrate in text and photo both the benign and malignant tumors of the oral cavity with such clearness that the general practitioner and dentist can arrive at a differential diagnosis prior to biopsy.

The authors have kept careful records of their patients and have supplemented these with studies from doctors handling types of cases outside the area of their clinic. The book, after a brief section on principles of neoplastic diseases, discusses tumors of the oral mucosa and accessory cavities, neoplasms of the jaws, quasi-tumors of the jaws, and cysts of the jaws. Anatomy, incidence, etiology, pathology, clinical and roentgenographic appearances, differential diagnosis, treatment, and prognosis are considered in each case.

The text style is terse—italics and outline form are well used for quick reference and emphasis. The excellent textual organization is supplemented by clear and consistent type style and make-up. The conclusions of the text—as in the case of symptom differentiation—are, when possible, represented in charts. Photographs, many of them and well organized, are an outstanding feature. After textual explanation, the photographs are clear visual criteria for differentiating between benign and malignant growths. Reading references appear at the end of each chapter, and an extensive index is keyed to both text and illustrations.

▶ THE OFFICE ASSISTANT IN MEDICAL OR DENTAL PRACTICE. By Portia M. Frederick, Instructor, Medical Office Assisting, Long Beach City College; and Carol Towner, Executive Assistant, Department of Public Relations, American Medical Association. Cloth. Pp. 351, with illustrations. Price $4.75. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

Office assistants are here to stay. The information in this book plus common sense and diligence would enable many to develop exceptional professional worth. After a college-brochure type of introduction, this book gives detailed information concerning business procedure, from medical ethics to bookkeeping, and the duties involved in assisting the doctor, including care and sterilization of instruments, preparation of patients, injections, medication, and physical therapy, as well as the editorial and library duties which arise from time to time. The treatment is specific, and the forms, instruments, and devices discussed are illustrated. Two appendixes offer additional reading lists and lists of common abbreviations and symbols.

▶ BLAKISTON'S NEW GOULD MEDICAL DICTIONARY. A modern, comprehensive dictionary of the terms used in all branches of medicine and allied sciences, including medical physics and chemistry, dentistry, pharmacy, nursing, veterinary medicine, zoology and botany, as well as medicolegal terms; with illustrations and tables. Editors, Normand L. Hoerr, M.D., and Arthur Osol, Ph.D., With the Cooperation of an Editorial Board and 88 Contributors. Ed. 2. Cloth. Pp. 1463. Price $11.50. The Blakiston Division, McGraw-Hill Book Company, 330 W. 42nd St., New York 36, 1956.

Revision—the addition of many new words and terms, the notation of changes in meaning, and the deletion of obsolete terms—is the keynote of the second edition of Blakiston's New Gould Medical Dictionary. Over 12,000 new terms have been added, 8,000 meanings expanded or changed, and, in recognition of the beneficial use of the atom, a table of Radioactive and Other Isotopes Commonly Used in Medicine included. Other fields which have received increased attention are chest surgery, psychiatry, oncology, dentistry, and veterinary medicine. Revision has enhanced this already remarkably useful volume.

▶ HANDBOOK OF TOXICOLOGY. Acute Toxicities of Solids, Liquids and Gases to Laboratory Animals. Volume 1. Edited by William S. Spector. Prepared under the Direction of the Committee on the Handbook of Biological Data, Division of Biology and Agriculture; The National Academy of Sciences; The National Research Council. Paper. Pp. 408. Price $7.00. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

This is the first volume of what is projected as a series of at least five volumes devoted to toxicology as it is reflected in lethal doses of poisonous agents in various common laboratory animals. The present volume presents, in tabular form, data that depict the type of lethal dose, route of administration, dosage in mg./kg., the vehicle used in administration, time of death, and bibliographic references for 2120 agents as well as the lethal concentrations of fume or vapors from 243 substances. The book, with its subsequent volumes, should be of great value to those who work with experimental animals, but is not intended as a useful addition to the practicing physician's library.